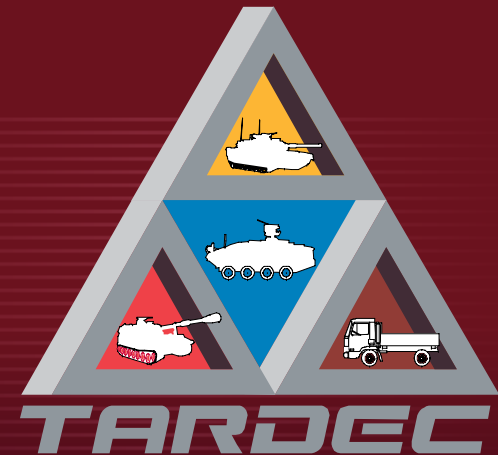




FALCON Pilot

Applying Open Standards for PLM
Systems Interoperability



TECHNOLOGY DRIVEN. WARFIGHTER FOCUSED.

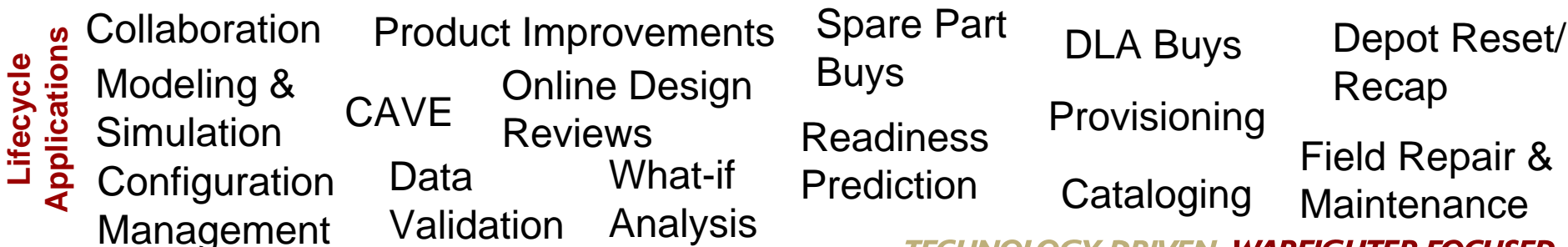
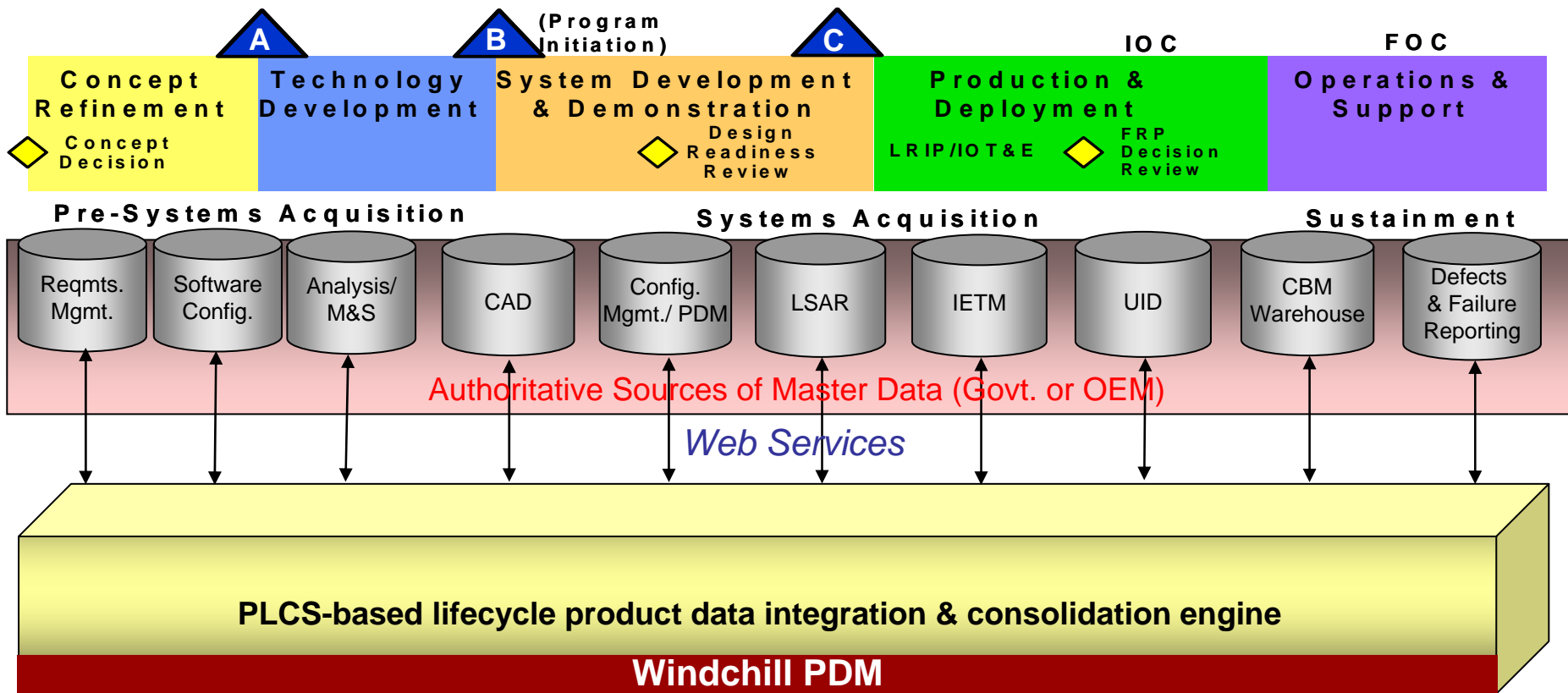
Dr. Raj Iyer

Team Leader, PLM

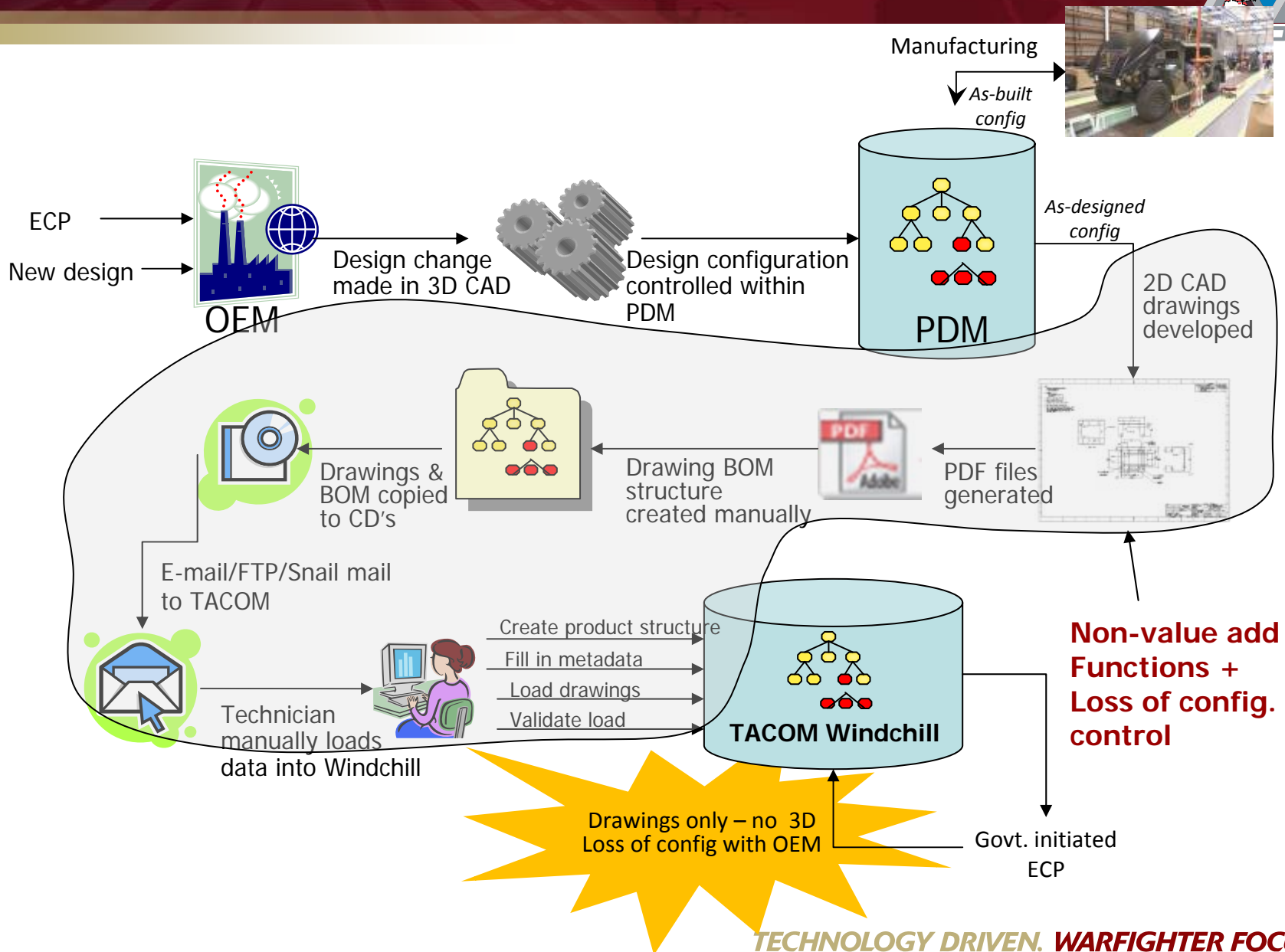
US Army Tank Automotive R&D
Center, Warren, Michigan, USA

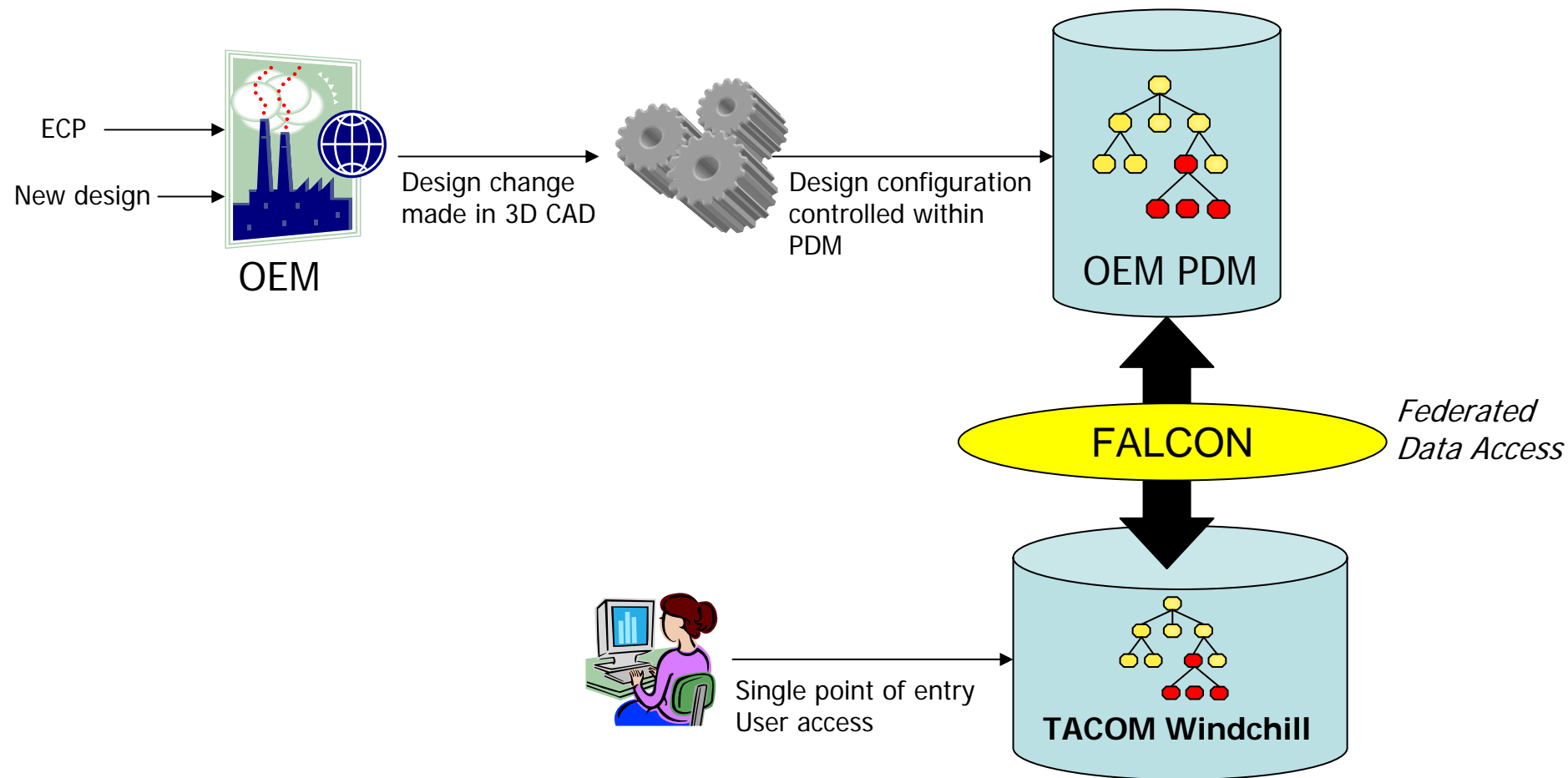
Report Documentation Page				Form Approved OMB No. 0704-0188	
Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.					
1. REPORT DATE 26 SEP 2007		2. REPORT TYPE N/A		3. DATES COVERED -	
4. TITLE AND SUBTITLE FALCON Pilot Applying Open Standards for PLM Systems Interoperability				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S) Dr. Raj Iyer				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) US Army RDECOM-TARDEC 6501 E 11 Mile Rd Warren, MI 48397-5000				8. PERFORMING ORGANIZATION REPORT NUMBER 17642	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSOR/MONITOR'S ACRONYM(S) TACOM/TARDEC	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release, distribution unlimited					
13. SUPPLEMENTARY NOTES Presented at the Product Data Technology Europe 2007 16th Symposium, 24th-26th September 2007 Geneva, Switzerland, The original document contains color images.					
14. ABSTRACT					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT SAR	18. NUMBER OF PAGES 47	19a. NAME OF RESPONSIBLE PERSON
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified			

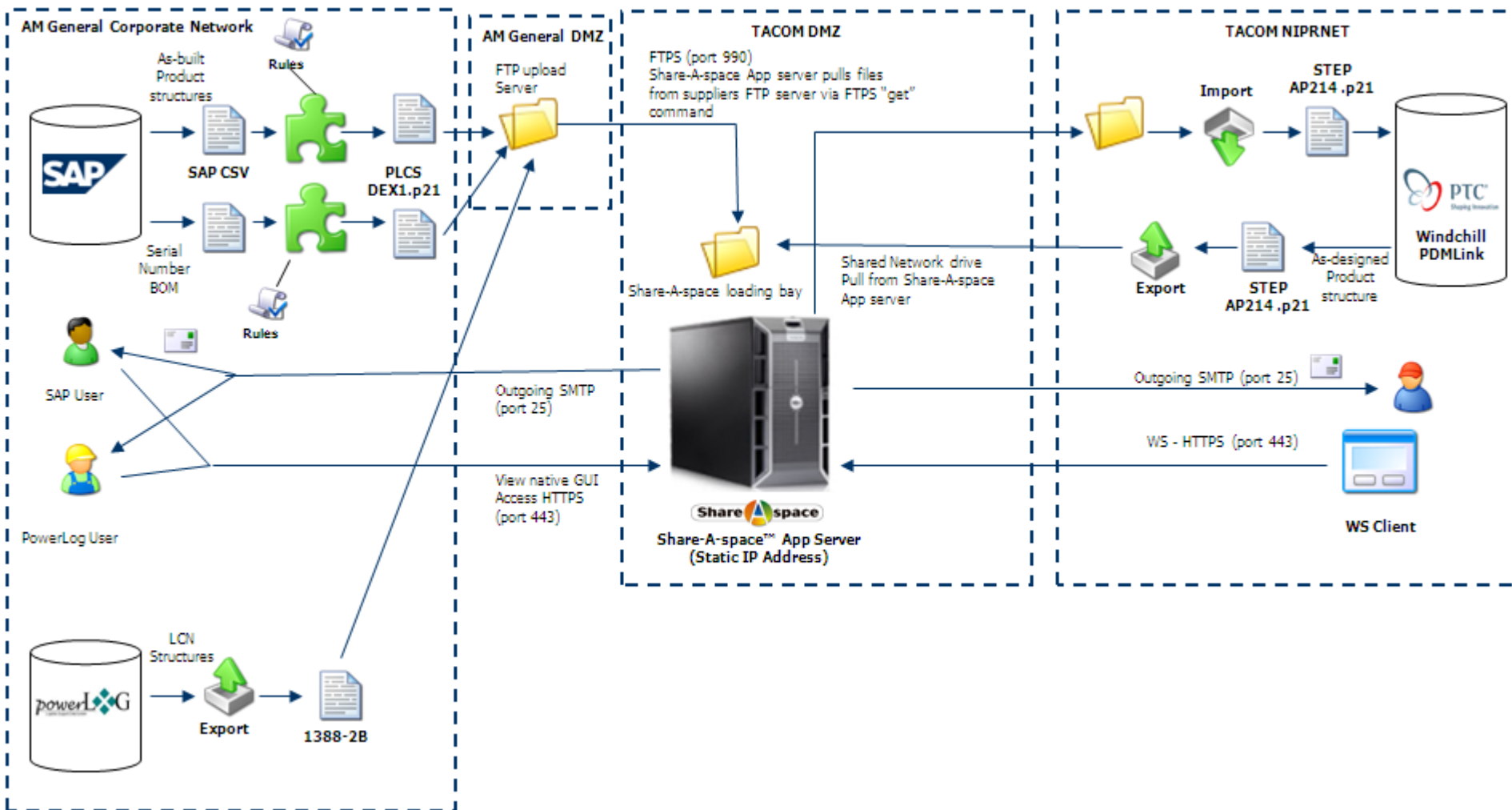
- Present the FALCON approach:
 - the application of the PLCS standard and Share-A-space technology as a “master data integrator” within the Falcon Program Architecture
- Demonstrate:
 - Improved data communication from AM General to TARDEC
 - Visibility of richer design data sets to TARDEC
 - Ability to compare
 - Access to details of individual delivered vehicles



- The Army receives design data as drawings (pdf files)
- Drawings are held by the Army in Windchill
 - Corresponding meta data is entered manually
- Product structure is supplied as indented parts lists
 - Corresponding data is entered manually into Windchill
- LSAR data is also provided as 1388-2B
 - Including Initial Provisioning Lists (as a report)
- Change documentation held in the Windchill system
 - Other intermediate changes made by AMG held in SAP
- What happens in AM General is not seen by the Army
 - Changes to HMMWV design for manufacturing not delivered to Army by contract
 - Approved changes do not necessarily get into manufacture







1. Load AM General design data

2. Load TARDEC Windchill data



5. Load Vehicle instance data and view in Share-A-space



3. Load AM General powerLog (1388-2b) data

4. Consolidated product data review with plug-in

Windchill Plug-in



HMMWV Pilot – Demo Scenario

1. Initial Data Load – AM General SAP Data

- Extract “As Used To Manufacture” data from AM General’s SAP
- Map/transform SAP data to PLCS (ISO 10303-239)
- Load data into Share-A-space

Product structure System Help

Product Structure: Validity date 07/06/2007

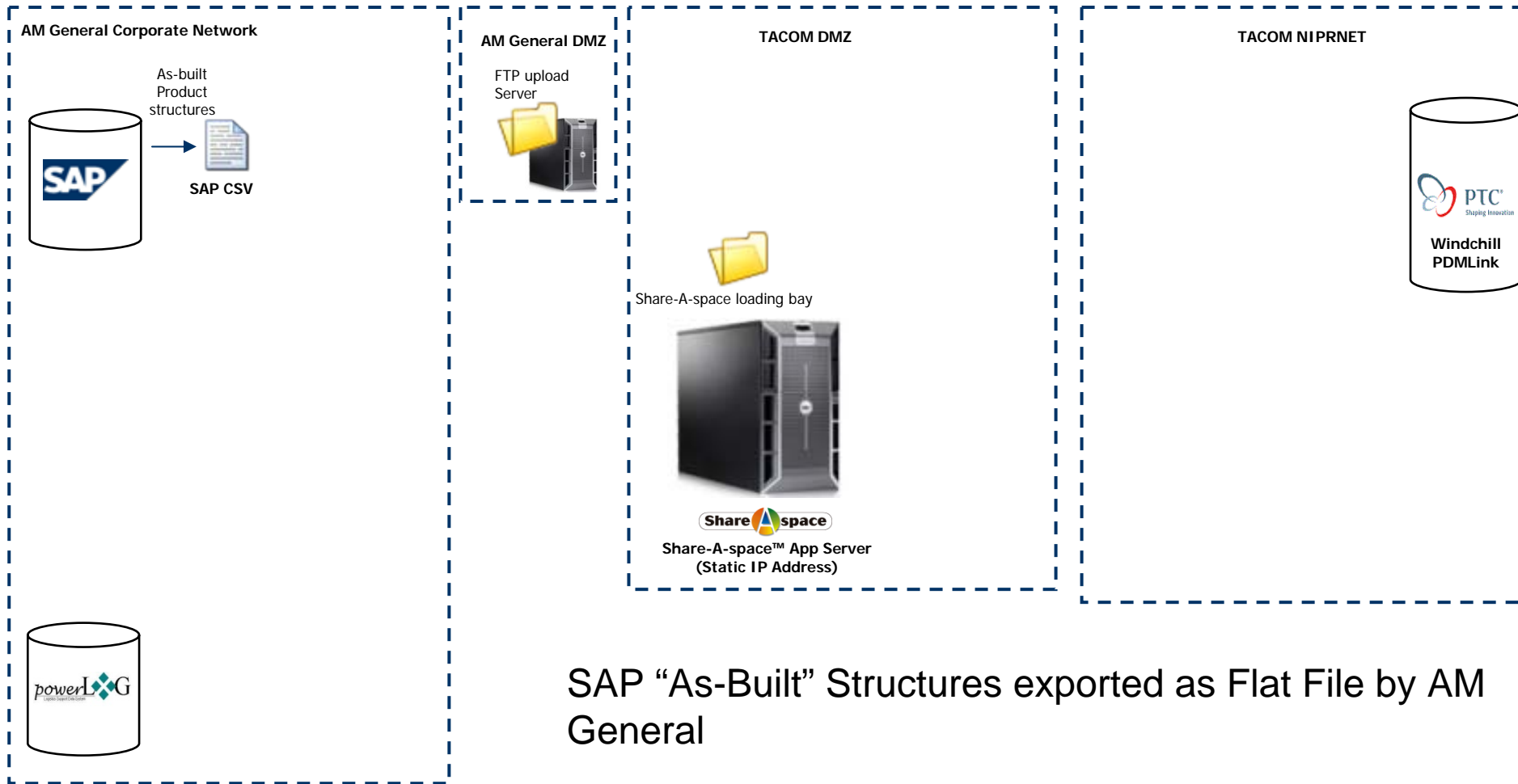
Product structure

Product structure	Status	Descript	Values	Workh	Del Ind	Original
12460078		INSTL EXHAUST SYSTEM	5			
Revision Levels						
E1						
Change Number						
1716-S677		RELEASE LATEST LEVEL III TDP IN				
Documents						
DRW 12460078 000 00	AR	INSTL EXHAUST SYSTEM	5			
DRW 12460078 000 01	FR	INSTL EXHAUST SYSTEM				
Versions						
Revision Levels						
Source Document						
Change Number						
1716-S677		RELEASE LATEST LEVEL III TDP IN				
Object Links						
Classification						
Change Numbers						
Classification						

0272 L 9416918	1/4-20 HX SERR FLG LN CASE		4
0280 L 2436163	3/8 FW TY B HRDND GM STD 2C		54
0295 L EC12338340	BRACKET ASM MUFFLER MTG		1
0300 L 12460081	HEAT SHIELD ASM 100		1
Change Numbers			

CWEYERS sapprdc1 INS

Initial Data Load – AMG SAP



SAP “As-Built” Structures exported as Flat File by AM General














SAP export



AMG_SAP_Demo.txt - Notepad									
File	Edit	Format	View	Help					
Part	100	102581	"SCREW,SET SOCKET 5/16-18X3/8	"	"SCREW,SET SOCKET 5/16-18X3/8	109"	31-Mar-2003		
	100	102670	3/16 X .4375 BTN SM SOLID RVT		3/16 X .4375 BTN SM SOLID RVT	201	#N/A		
	100	106868	RIVET		RIVET	201	#N/A		
	100	10-8-070102	"CONNECTOR, STRAIGHT MALE	"	"CONNECTOR, STRAIGHT MALE	201"	9-Jan-2006		
	100	10-8-070302	"ELBOW, 45 DEG.-MALE	"	"ELBOW, 45 DEG.-MALE	201"	9-Jan-2006		
	100	10871581	HINGE ASM		HINGE ASM	201	#N/A		
	100	10871583	PIN		PIN	201	#N/A		
	100	10871585	LEAF		LEAF	201	#N/A		
	100	10875481	BAND		BAND	201	#N/A		

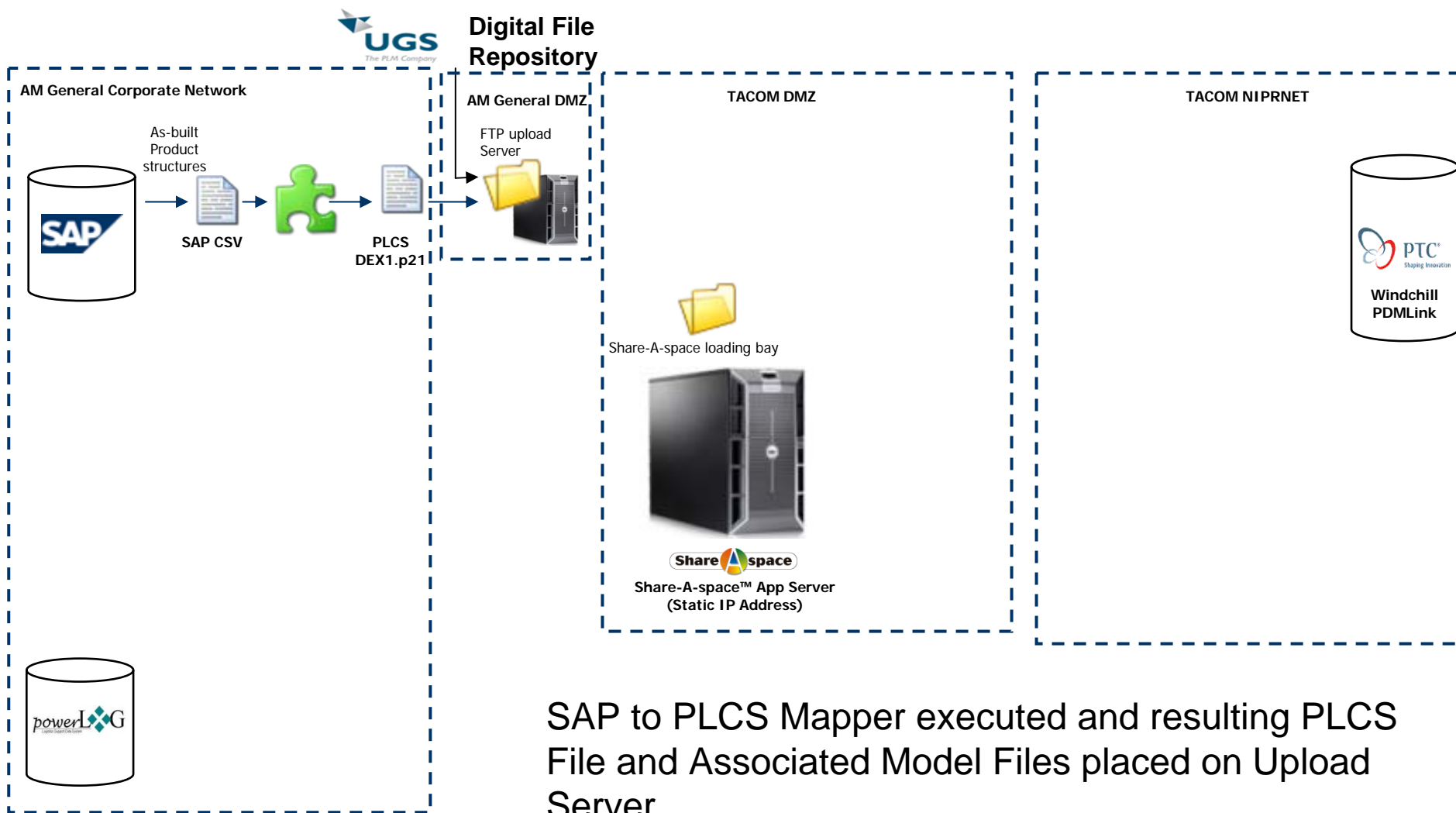
AMG_SAP_Demo.txt - WordPad

File Edit View Insert Format Help

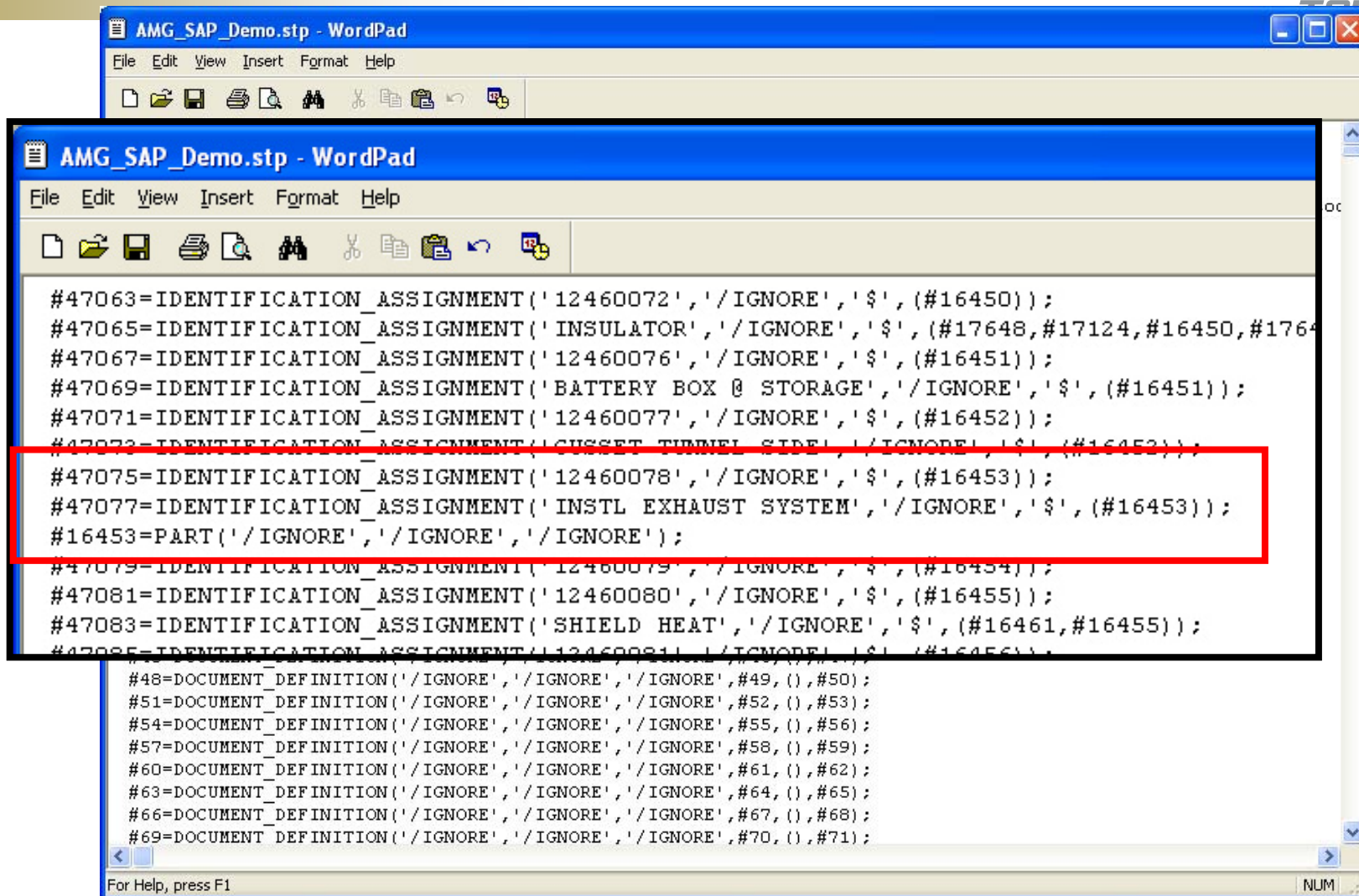


Part									
100		12460078		E1		INSTL EXHAUST SYSTEM			INSTL EXHAUST SYSTEM
100		102581				"SCREW,SET SOCKET 5/16-18X3/8		"	"SCREW,SET SOCKET 5/16-18X3/8
100		102670				3/16 X .4375 BTN SM SOLID RVT			3/16 X .4375 BTN SM SOLID RVT
100		106868				RIVET			RIVET
100		10-8-070102				"CONNECTOR, STRAIGHT MALE		"	"CONNECTOR, STRAIGHT MALE
100		10-8-070302				"ELBOW, 45 DEG.-MALE		"	"ELBOW, 45 DEG.-MALE
100		10871581				HINGE ASM			HINGE ASM
100		10871583				PIN			PIN

100	11613707	PLATE		PLATE	201	#N/A
100	11613708	CONTACT		CONTACT	201	#N/A
100	11614131	SWITCH ASM - ROTARY		SWITCH ASM - ROTARY	100	#N/A
100	11614131-1	SWITCH		SWITCH	201	#N/A
100	11614156	1A COMPOSITE LIGHT (AMBER)		COMPOSITE LIGHT (AMBER)	100	13-Dec-2000
100	11614157	1A COMPOSITE LIGHT (ALL DE		COMPOSITE LIGHT (ALL DE	100	13-Dec-2000
100	11639519-1	GASKET		GASKET	201	#N/A
100	11639519-2	GASKET		GASKET	201	#N/A
100	11639520	BODY ASSY		BODY ASSY	201	#N/A
100	11639521	INSERT		INSERT	201	#N/A
100	11639522	BODY		BODY	201	#N/A
100	11639522-1	BODY		BODY	201	#N/A



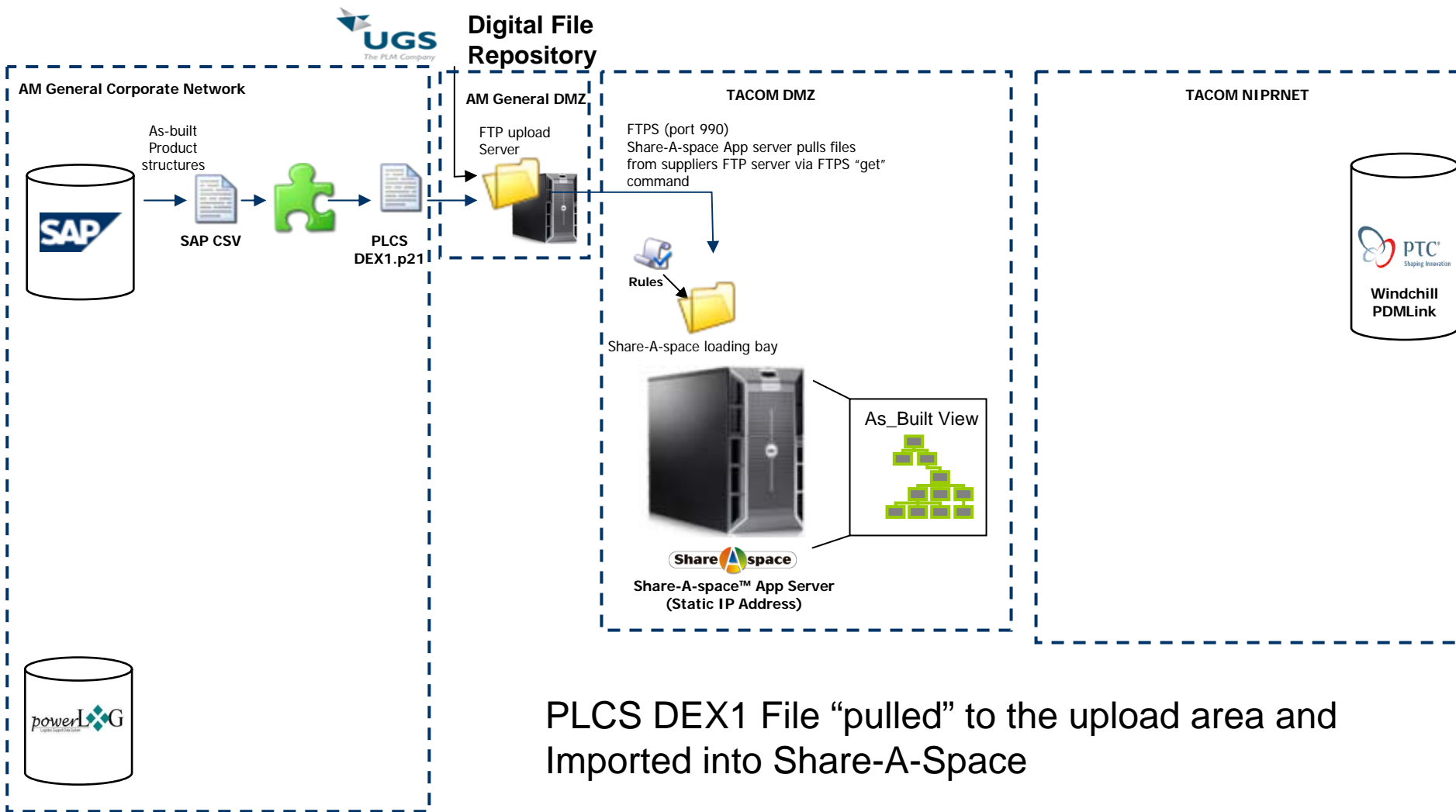
SAP to PLCS Mapper executed and resulting PLCS File and Associated Model Files placed on Upload Server

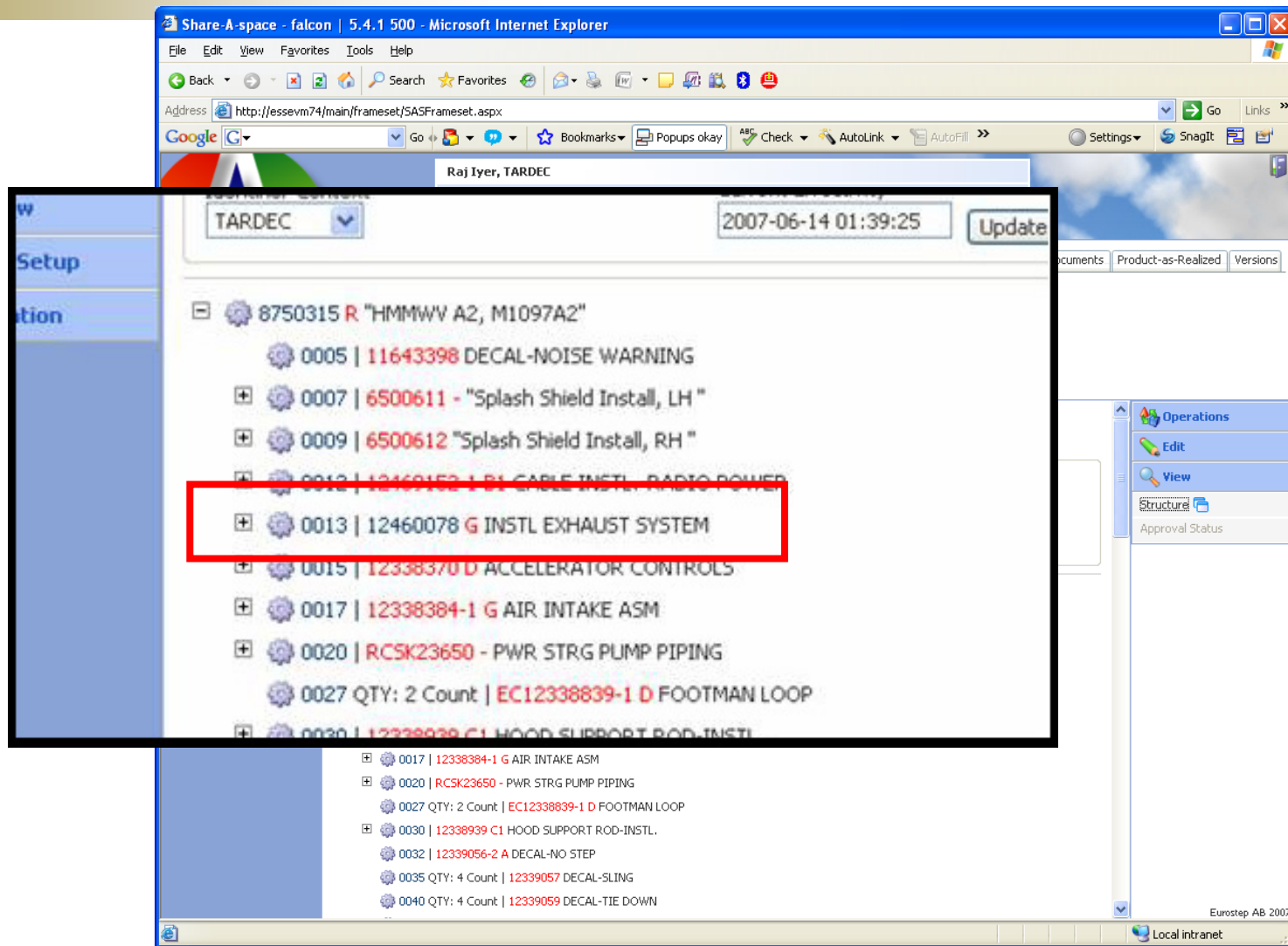


```

AMG_SAP_Demo.stp - WordPad
File Edit View Insert Format Help
[Icons]

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#47065=IDENTIFICATION_ASSIGNMENT('INSULATOR','/IGNORE','$',(#17648,#17124,#16450,#1764
#47067=IDENTIFICATION_ASSIGNMENT('12460076','/IGNORE','$',(#16451));
#47069=IDENTIFICATION_ASSIGNMENT('BATTERY BOX @ STORAGE','/IGNORE','$',(#16451));
#47071=IDENTIFICATION_ASSIGNMENT('12460077','/IGNORE','$',(#16452));
#47073=IDENTIFICATION_ASSIGNMENT('CUSSET TUNNEL SIDE','/IGNORE','$',(#16452));
#47075=IDENTIFICATION_ASSIGNMENT('12460078','/IGNORE','$',(#16453));
#47077=IDENTIFICATION_ASSIGNMENT('INSTL EXHAUST SYSTEM','/IGNORE','$',(#16453));
#16453=PART('/IGNORE','/IGNORE','/IGNORE');
#47079=IDENTIFICATION_ASSIGNMENT('12460079','/IGNORE','$',(#16454));
#47081=IDENTIFICATION_ASSIGNMENT('12460080','/IGNORE','$',(#16455));
#47083=IDENTIFICATION_ASSIGNMENT('SHIELD HEAT','/IGNORE','$',(#16461,#16455));
#47085=IDENTIFICATION_ASSIGNMENT('12460081','/IGNORE','$',(#16456));
#48=DOCUMENT_DEFINITION('/IGNORE','/IGNORE','/IGNORE',#49,(),#50);
#51=DOCUMENT_DEFINITION('/IGNORE','/IGNORE','/IGNORE',#52,(),#53);
#54=DOCUMENT_DEFINITION('/IGNORE','/IGNORE','/IGNORE',#55,(),#56);
#57=DOCUMENT_DEFINITION('/IGNORE','/IGNORE','/IGNORE',#58,(),#59);
#60=DOCUMENT_DEFINITION('/IGNORE','/IGNORE','/IGNORE',#61,(),#62);
#63=DOCUMENT_DEFINITION('/IGNORE','/IGNORE','/IGNORE',#64,(),#65);
#66=DOCUMENT_DEFINITION('/IGNORE','/IGNORE','/IGNORE',#67,(),#68);
#69=DOCUMENT_DEFINITION('/IGNORE','/IGNORE','/IGNORE',#70,(),#71);
For Help, press F1
NUM
  
```





Share-A-space - falcon | 5.4.1 500 - Microsoft Internet Explorer

Address: <http://jessevm74/main/frameset/SASFrameset.aspx>

Raj Iyer, TARDEC

2007-06-14 01:39:25

Update

Documents | Product-as-Realized | Versions

Operations

Edit

View

Structure

Approval Status

8750315 R "HMMWV A2, M1097A2"

- 0005 | 11643398 DECAL-NOISE WARNING
- 0007 | 6500611 - "Splash Shield Install, LH"
- 0009 | 6500612 "Splash Shield Install, RH"
- 0012 | 12460152-1 B1 CABLE INSTL RADIO POWER
- 0013 | 12460078 G INSTL EXHAUST SYSTEM**
- 0015 | 12338370 D ACCELERATOR CONTROLS
- 0017 | 12338384-1 G AIR INTAKE ASM
- 0020 | RCK23650 - PWR STRG PUMP PIPING
- 0027 QTY: 2 Count | EC12338839-1 D FOOTMAN LOOP
- 0030 | 12338939 C1 HOOD SUPPORT ROD-INSTL
- 0017 | 12338384-1 G AIR INTAKE ASM
- 0020 | RCK23650 - PWR STRG PUMP PIPING
- 0027 QTY: 2 Count | EC12338839-1 D FOOTMAN LOOP
- 0030 | 12338939 C1 HOOD SUPPORT ROD-INSTL
- 0032 | 12339056-2 A DECAL-NO STEP
- 0035 QTY: 4 Count | 12339057 DECAL-SLING
- 0040 QTY: 4 Count | 12339059 DECAL-TIE DOWN

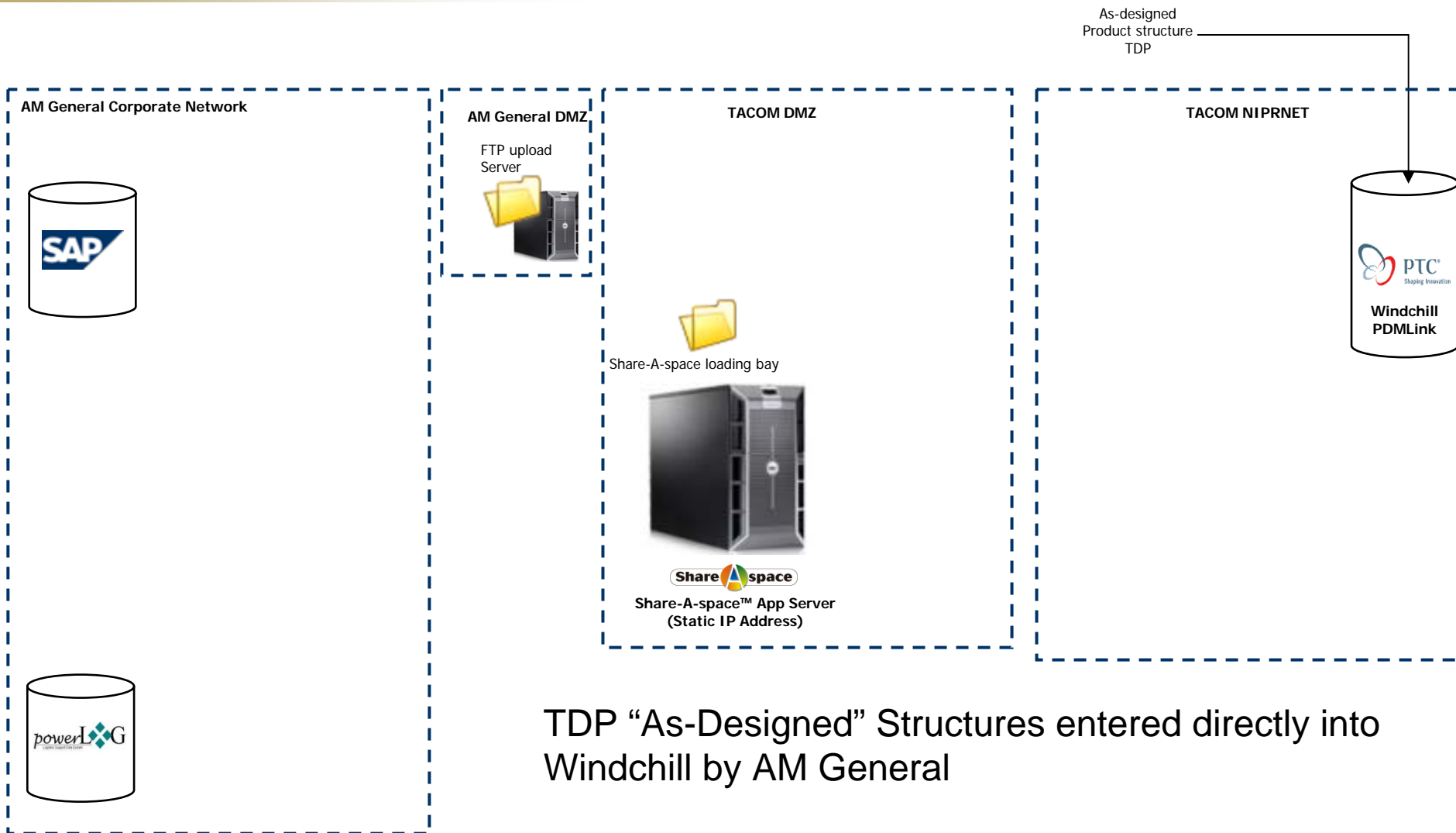
Eurostep AB 2007

Local intranet

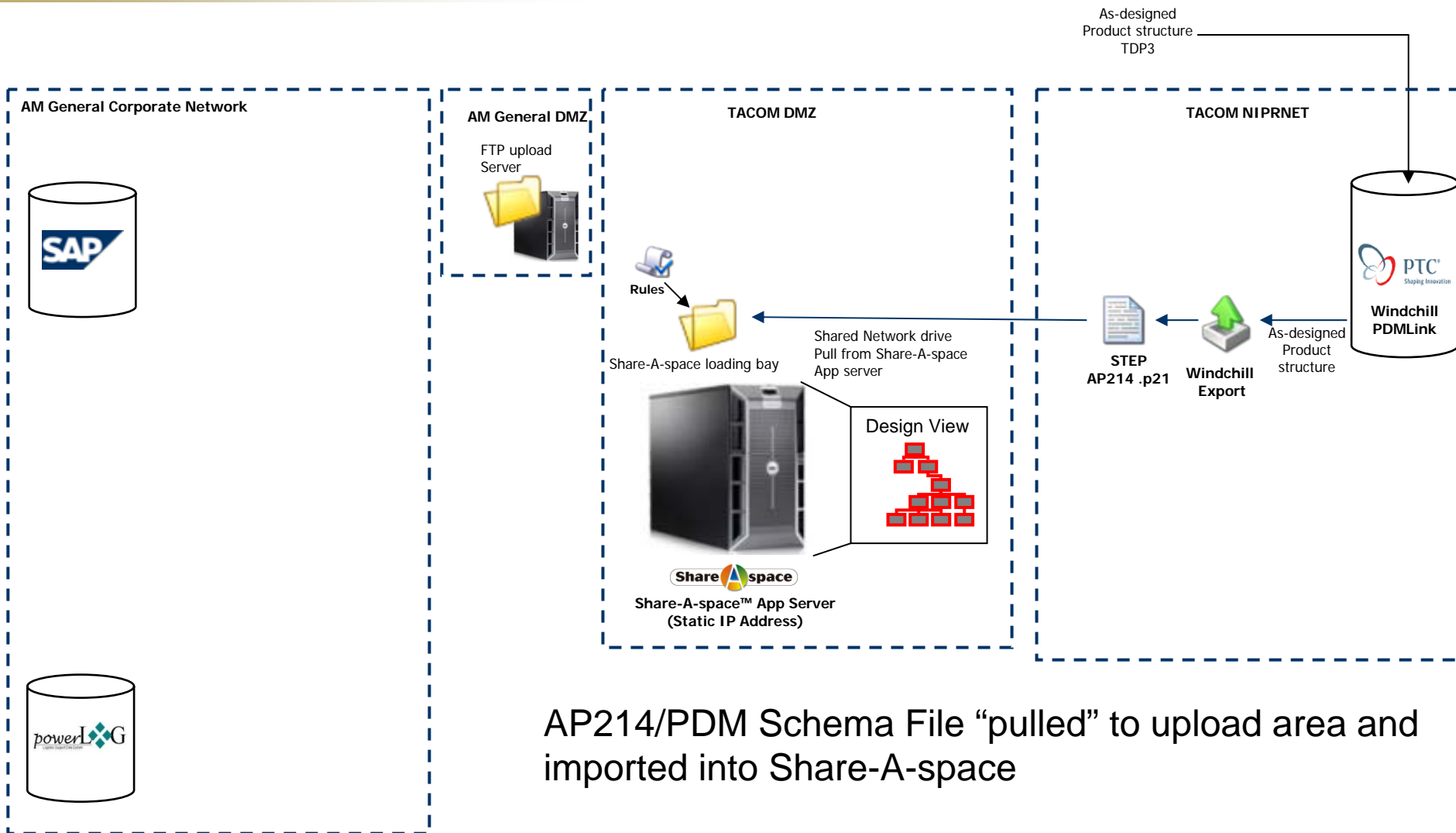
HMMWV Pilot – Demo Scenario

2. Initial Data Load – TARDEC Windchill Data

- Current content of TARDEC Windchill
- Extracted data from Windchill as STEP
- Loaded meta data into Share-A-space
 - Not supporting drawings/models
 - Used to enable comparison



TDP “As-Designed” Structures entered directly into Windchill by AM General



AP214/PDM Schema File “pulled” to upload area and imported into Share-A-space



Windchill Data in PDM Schema format



STEP_EXP_2007-5-12_10-2-47.stp - Notepad

File Edit Format View Help

ISO-10303-21;

STEP_EXP_2007-5-12_10-2-47.stp - WordPad

File Edit View Insert Format Help



ISO-10303-21;

HEADER;

FILE_DESCRIPTION(('Windchill STEP Data','windchill_schema'),'2;1');

FILE_NAME('C:\\ptc\\Windchill_8.0\\temp\\1181685770875_step\\STEP_EXP_2007-5-12_10-2-47.stp',
'2007-06-12T17:03:07',('author'),('Parametric Technology','Tech Marketing','Berlin','GE',
'11111'),'1.0','Windchill STEP Import/Export','ER');

FILE_SCHEMA(('PDM_SCHEMA'));

ENDSEC;

DATA;

#22= PRODUCT('12460078','EXHAUST SYSTEM INSTALLATION', 'EXHAUST SYSTEM INSTALLATION', (#3));

#1= APPLICATION_CONTEXT('mechanical design');

#3= PRODUCT_CONTEXT('', #1, '');

#4= APPLICATION_PROTOCOL_DEFINITION('version 1.1', 'pdm_schema', 1998, #1);

#5= PRODUCT_RELATED_PRODUCT_CATEGORY('part', \$, (#22, #24, #26, #28, #30, #32,
#34, #36, #38, #40, #42, #44, #46, #48, #50, #52, #54, #56, #58, #60, #62, #64, #66, #68,
#70, #72, #74, #76, #78, #80, #82, #84, #86, #88, #90, #92, #94, #96, #98, #100, #102,
#104, #106, #108, #110, #112, #114, #116, #118, #120, #122, #124, #126, #128, #130,
#132, #134, #136, #138, #140, #142, #144, #146));

#1574= PRODUCT_RELATED_PRODUCT_CATEGORY('Cage Code', '24617', (#74));

#7= PRODUCT_DEFINITION_CONTEXT('part definition', #1, 'design');

#40= PRODUCT('B1821BH038C200N', 'Screw,Cap,Hexagon Head',

'Screw,Cap,Hexagon Head', (#3));

#42= PRODUCT('9416918', 'NUT', 'NUT', (#3));

#44= PRODUCT('12338343-2', 'CLAMP ASSEMBLY, MUFFLER, 3-INCH FULL CIRCLE',

Share-A-space - falcon | 5.4.1 500 - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Address http://esevm74/main/frameSet/SASFrameSet.aspx

Google Go Bookmarks Popups okay ABC Check AutoLink AutoFill Settings Snagit

Raj Iyer, TARDEC

Project Role: Administrator, TARDEC Application Context: MecDev MecDes MaiSup

Effectivity: 2007-06-14 01:39:25 : Actual Identifier Context: TARDEC

12460078, G, INSTL EXHAUST SYSTEM

Description N/A Level State MecDes - Not In Level State System

Creator Craig Wyers MecDev - Not In Level State System

Created Date 2007-06-12 22:24:02

Owner AM General

Item Structure

Presentation Options

Application Context MecDes[Mechanical/Design] Effectivity Mode Actual

Identifier Context TARDEC Current Effectivity 2007-06-14 01:39:25 Update

12460078 G INSTL EXHAUST SYSTEM

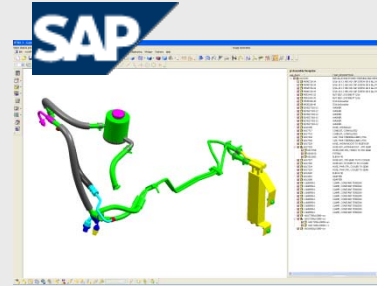
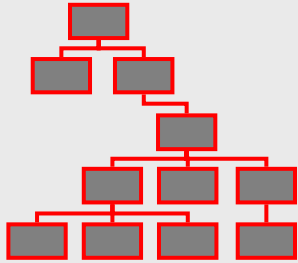
- 0010 QTY: 2 Count | MS35842-14 CLAMP-HOSE
- 0020 | 12460090 B MUFFLER CERAMIC FIBER
- 0025 | 11608950-24 G1 8.62-2 HOSE CLAMP
- 0030 QTY: 2 Count | 12338337 E INSULATOR PAD TAILPIPE
- 0040 QTY: 2 Count | 12338338 INSULATOR RADIATOR SUPT
- 0050 QTY: 3 Count | 12338339 GASKET - CAT CONW TO MUFF
- 0070 QTY: 6 Count | EC12338341 A2 PLATE-REINF-INSULATOR
- 0080 QTY: 2 Count | 12338342 SEAL ASM EXHAUST MANIFOLD
- 0090 | 12338343-1 C2 CLAMP ASM
- 0100 QTY: 2 Count | 12338343-2 C2 CLAMP ASSY - MUFFLER
- 0110 | 12338346 A2 HANGER ASM - TAILPIPE
- 0130 | 12460082 B SHIELD ASM - HEAT
- 0140 | 12338350 A1 TAILPIPE ASSEMBLY

Operations

Edit View Structure Approval Status

Eurostep AB 2007

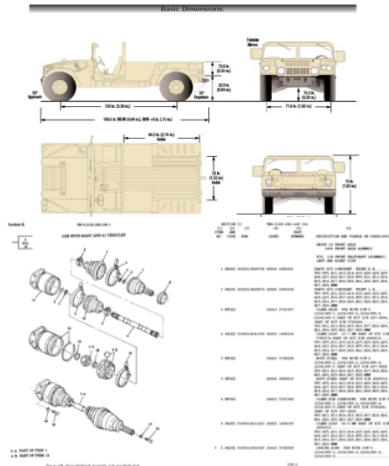
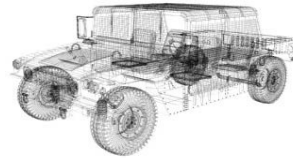
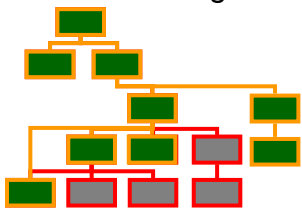
Done Local intranet



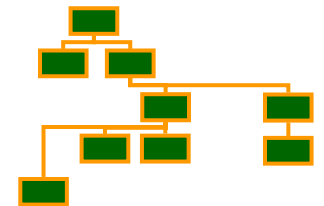
"As Used To Manufacture" Version Release



**"As Used to Manufacture"
View + As Designed View**



**As Designed
View**



- Complete As-Manufactured data set loaded from AM General SAP to Share-A-space
 - 3030 parts plus example CAD models and drawings
- Partial data set loaded from TARDEC's Windchill system for demo
 - Exhaust sub system comprising 63 Parts

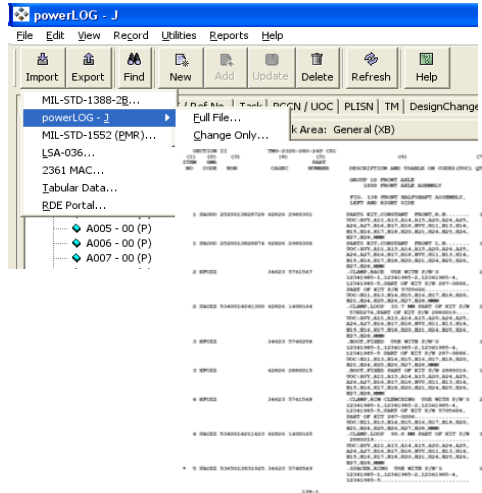
HMMWV Pilot – Demo Scenario

3. Initial Data Load – AM General powerLog Data

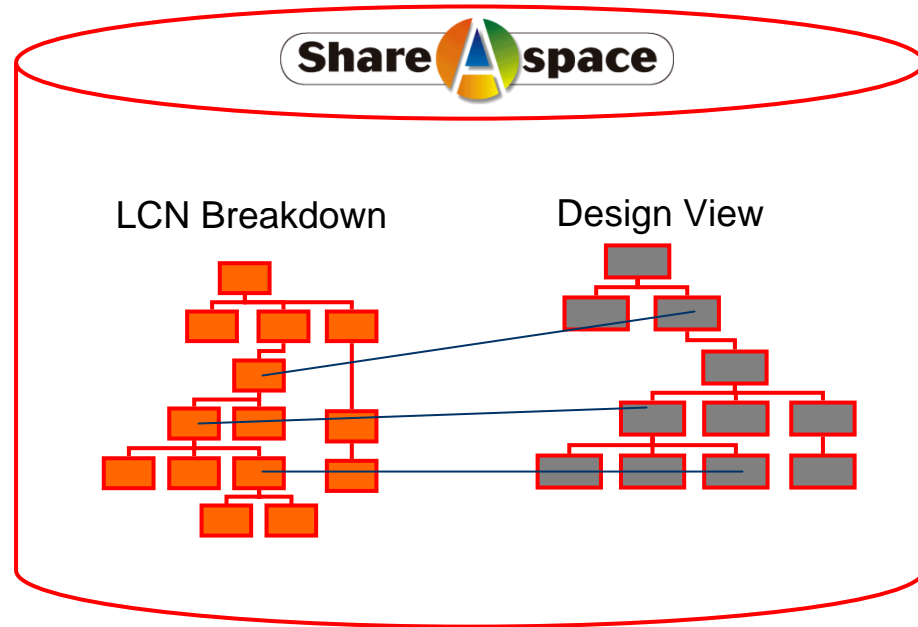
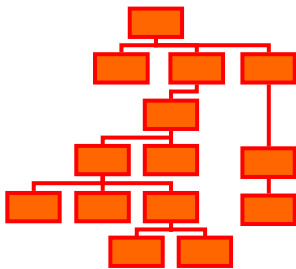
- Mil Std 1388 covers a broad scope of logistic support analysis (LSA) including failure modes, task analysis and spare-parts
 - This analysis is usually undertaken as part of designing the support system for a product
- AM General use a report generated from Mil Std 1388 data to supply provisioning list data to the Army
 - The data and report are created using the powerLog system
 - powerLog is the reference Mil Std 1388 implementation produced by LOGSA
- The data provided by AM General covers a limited subset of Mil Std 1388:
 - A breakdown of the end-item using Logistic Control Numbers (LCNs) to identify relevant positions
 - The data here is a physical breakdown (cf. functional) that corresponds to an assembly structure
 - Links from that breakdown to the corresponding parts
- As much more of Mil Std 1388 is relevant to PLCS it was decided to work with the data as held by powerLog rather than the output report
 - The reduced scope allowed use of existing PLCS DEX capabilities
 - Coverage of the full scope of Mil Std 1388 by PLCS DEXs is not yet in place

powerLOG
Logistics Support Data System

LSAR



LCN Breakdown



powerLOG - J

File Edit View Record Utilities Reports Help

Import Export Find New Add Update Delete Refresh Help

PLISN TM DesignChange Facility Skill Job Drawing
EIAC Indentured Item CAGE / Ref No. Task PCCN / UOC

Work Area: Provisioning > Part Application (HG)

HMV

- A - 00 (P)
 - A01 - 00 (P)
 - A01A01 - 00 (P)
 - A01B - 00 (P)
 - A01B01 - 00 (P)
 - A01B02 - 00 (P)
 - A01B03 - 00 (P)
 - A01C - 00 (P)
 - A01C01 - 00 (P)**
 - A01C02 - 00 (P)
 - A01C03 - 00 (P)
 - A01C04 - 00 (P)
 - A01D - 00 (P)
 - A01D01 - 00 (P)
 - A01D02 - 00 (P)
 - A01D03 - 00 (P)
 - A01D04 - 00 (P)
 - A01E - 00 (P)
 - A01E01 - 00 (P)
 - A01E02 - 00 (P)
 - A01E03 - 00 (P)
 - A01F - 00 (P)
 - A01F01 - 00 (P)
 - A01F02 - 00 (P)
 - A01G - 00 (P)
 - A01G01 - 00 (P)
 - A01G02 - 00 (P)

CAGE Reference Number Item Name
9C234 12460083-1 BRACKET

General PTD MTD/RTD/RCT First Appearance Misc.

Key

CAGE Code 9C234

Ref No. 12460083-1

EIAC HMV

LCN A01C01

ALC 00

LCN Type P - Physical

PLISN

Prior Item PLISN

Indenture Code

Maintenance Action Code

Max. Allowable Operating Time

Essentiality Code

☐ Line Replaceable Unit (LRU)

SMR Code

Quantity Per Assembly (QPA)

MRR 1

MRR 2

MRR Modifier

Work Unit Code

Check out <https://www.logsa.army.mil/alc/powerLOG-J/>

41 item(s) Showing all items mapped to EIAC HMV

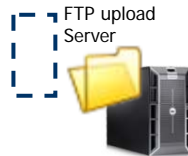
start powerLOG - J The GIMP

EN Type to search 16:41

AM General Corporate Network



AM General DMZ

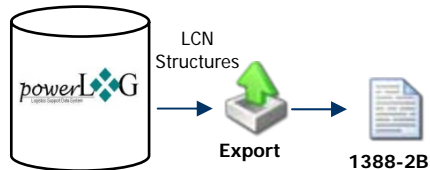


TACOM DMZ



Share-A-space™ App Server
(Static IP Address)

TACOM NIPRNET



powerLog LSAR Data exported to MilStd 1388-2B
format using powerLog Export capability

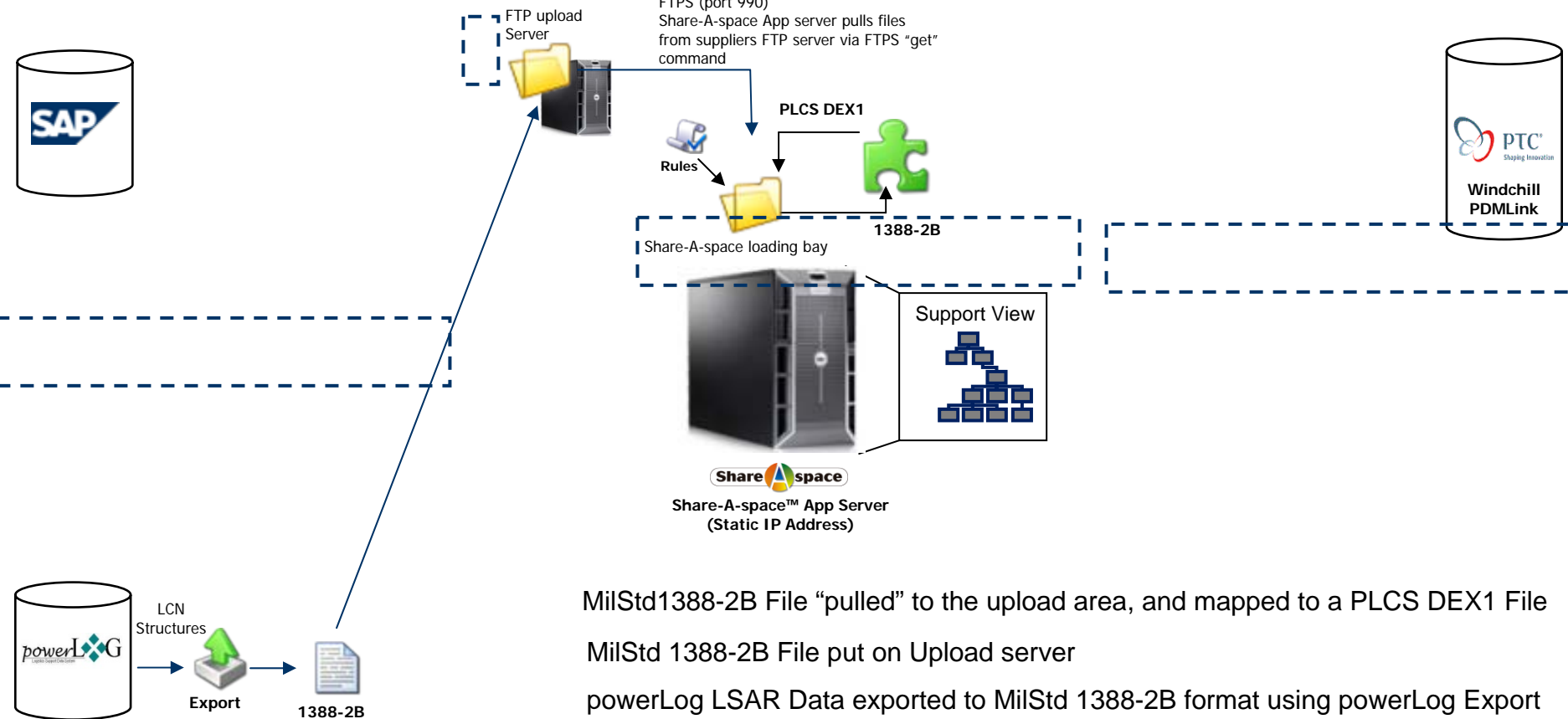


LSA data exported as 1388-2B format



```
demo.dat - WordPad
File Edit View Insert Format Help
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
XA HMV 1212211111113
XB HMV A 00PACHMMWBVY
XB HMV A01 00PBFRAME ASSY, COMPLET
XB HMV A01A01 00PDCROSSMEMBER
XB HMV A01B 00PCBRACKETS - FRAME
XB HMV A01B01 00PDBRACKETS #4 - FRAME
XB HMV A01B02 00PDBRACKETS #1 - FRAME
XB HMV A01B03 00PDBRACKETS #1 - FRAME
XB HMV A01C 00PCBRACKETS - FRONT AX
XB HMV A01C01 00PDBRACKET - FRONT AXL
XB HMV A01C02 00PDPLATE RH
XB HMV A01C03 00PDBRACKET - FRONT AXL
XB HMV A01C04 00PDPLATE LH
XB HMV A01D 00PCBRACKETS - REAR AXL
XB HMV A01D01 00PDBRACKET - REAR AXLE
XB HMV A01D02 00PDBRACKET - REAR AXLE
XB HMV A01D03 00PDPLATE RH
XB HMV A01D04 00PDPLATE LH
XB HMV A01E 00PCREINFORCEMENT FRAME
XB HMV A01E01 00PDREINFORCEMENT
XB HMV A01E02 00PDBRACKET LT
XB HMV A01E03 00PDBRACKET RT
XB HMV A01F 00PCENGINE MOUNTING
XB HMV A01F01 00PDBRACKET, ENGINE SUP
XB HMV A01F02 00PDGUSSET, ENGINE SUPP
XB HMV A01G 00PCAIR LIFT MOUNTING
XB HMV A01G01 00PDAIR LIFT MOUNTING R
XB HMV A01G01AA 00PETUBE - AIRLIFT RH
XB HMV A01G01AB 00PEPLATE - AIRLIFT RH
XB HMV A01G01AC 00PEFIXINGS - AIRLIFT R
XB HMV A01G01AD 00PEMOUNTING PLATE - AI
XB HMV A01G01AE 00PEEYE - AIRLIFT RH
XB HMV A01G01AF 00PECHANNEL - AIRLIFT R
XB HMV A01G01AG 00PESPLASH SHIELD BRACK
XB HMV A01G02 00PDAIR LIFT MOUNTING L
XB HMV A01G02AA 00PEMOUNTING PLATE LH
XB HMV A01G02AB 00PECHANNEL - AIR LIFT
XB HMV A01G02AC 00PEEYE - AIR LIFT LH
XB HMV A01G02AD 00PESPLASH SHIELD BRACK
XB HMV A01G02AE 00PEWIRE HARNESS BRACKE
XB HMV A01G02AF 00PEBRACKET - AIR LIFT
XB HMV A01G02AG 00PEPLATE - AIR LIFT LH
XH 9C234
HA 9C234RCSK26020 AIR LIFT LH
HA 9C234RCSK26042 BRACKET, AIR LFT LH
HA 9C23412338150-9 BRACKET-FRONT AXXL
For Help, press F1
```

AM General Corporate Network



MilStd1388-2B File “pulled” to the upload area, and mapped to a PLCS DEX1 File

MilStd 1388-2B File put on Upload server

powerLog LSAR Data exported to MilStd 1388-2B format using powerLog Export capability

PLCS DEX1 File imported into Share-A-space and connected to the “As_Designed” structure



1388-2B export mapped to PLCS



demo.dat - WordPad

File Edit View Insert Format Help

1 2 3 4 5 6 7

XA	HMV	1212211111113	
XB	HMV	A	00
XB	HMV	A01	00
XB	HMV	A01A01	00
XB	HMV	A01B	00
XB	HMV	A01B01	00
XB	HMV	A01B02	00
XB	HMV	A01B03	00
XB	HMV	A01C	00
XB	HMV	A01C01	00
XB	HMV	A01C02	00
XB	HMV	A01C03	00
XB	HMV	A01C04	00
XB	HMV	A01D	00
XB	HMV	A01D01	00
XB	HMV	A01D02	00
XB	HMV	A01D03	00
XB	HMV	A01D04	00
XB	HMV	A01E	00
XB	HMV	A01E01	00
XB	HMV	A01E02	00

XB HMV A01G 00

XB HMV A01G01 00

XB HMV A01G01AA 00

XB HMV A01G01AB 00

XB HMV A01G01AC 00

XB HMV A01G01AD 00

XB HMV A01G01AE 00

XB HMV A01G01AF 00

XB HMV A01G01AG 00

XB HMV A01G02 00

XB HMV A01G02AA 00

XB HMV A01G02AB 00

XB HMV A01G02AC 00

XB HMV A01G02AD 00

XB HMV A01G02AE 00

XB HMV A01G02AF 00

XB HMV A01G02AG 00

XH 9C234

HA 9C234RCSK26020

HA 9C234RCSK26042

HA 9C23412338150-9

For Help, press F1

AMG_LSAR_demo.stp - WordPad

File Edit View Insert Format Help

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

```
#234=IDENTIFICATION_ASSIGNMENT('12338148','/IGNORE','$',(#145));
#236=IDENTIFICATION_ASSIGNMENT('BRK'T #4 X-MBR LT','/IGNORE','$',(#145));
#238=IDENTIFICATION_ASSIGNMENT('A01B01','/IGNORE','$',(#621));
#240=IDENTIFICATION_ASSIGNMENT('HVM_A01B02_00','/IGNORE','$',(#106));
#242=IDENTIFICATION_ASSIGNMENT('BRACKETS #1 - FRAME','/IGNORE','$',(#106,#107));
#244=IDENTIFICATION_ASSIGNMENT('12338149-1','/IGNORE','$',(#146));
#246=IDENTIFICATION_ASSIGNMENT('BRK'T, #1 X-MBR LT','/IGNORE','$',(#146));
#248=IDENTIFICATION_ASSIGNMENT('A01B02','/IGNORE','$',(#636));
#250=IDENTIFICATION_ASSIGNMENT('HVM_A01B03_00','/IGNORE','$',(#107));
#252=IDENTIFICATION_ASSIGNMENT('12338149-2','/IGNORE','$',(#147));
#254=IDENTIFICATION_ASSIGNMENT('BRK'T, #1 X-MBR RT','/IGNORE','$',(#147));
#256=IDENTIFICATION_ASSIGNMENT('A01B03','/IGNORE','$',(#649));
#258=IDENTIFICATION_ASSIGNMENT('HVM_A01C_00','/IGNORE','$',(#108));
#260=IDENTIFICATION_ASSIGNMENT('BRACKETS - FRONT AX','/IGNORE','$',(#108));
#262=IDENTIFICATION_ASSIGNMENT('A01C','/IGNORE','$',(#660));
#264=IDENTIFICATION_ASSIGNMENT('HVM_A01C01_00','/IGNORE','$',(#109));
#266=IDENTIFICATION_ASSIGNMENT('BRACKET - FRONT AXL','/IGNORE','$',(#109,#111));
#268=IDENTIFICATION_ASSIGNMENT('12460083-1','/IGNORE','$',(#148));
#270=IDENTIFICATION_ASSIGNMENT('BRACKET','/IGNORE','$',(#148,#151));
#272=IDENTIFICATION_ASSIGNMENT('A01C01','/IGNORE','$',(#675));
#274=IDENTIFICATION_ASSIGNMENT('HVM_A01C02_00','/IGNORE','$',(#110));
#276=IDENTIFICATION_ASSIGNMENT('PLATE RH','/IGNORE','$',(#110,#116));
#278=IDENTIFICATION_ASSIGNMENT('12338150-5','/IGNORE','$',(#149));
#280=IDENTIFICATION_ASSIGNMENT('PLATE','/IGNORE','$',(#153,#149));
#282=IDENTIFICATION_ASSIGNMENT('A01C02','/IGNORE','$',(#690));
#284=IDENTIFICATION_ASSIGNMENT('HVM_A01C03_00','/IGNORE','$',(#111));
#286=IDENTIFICATION_ASSIGNMENT('12338150-9','/IGNORE','$',(#150));
#288=IDENTIFICATION_ASSIGNMENT('BRACKET-FRONT AXXL','/IGNORE','$',(#150));
#290=IDENTIFICATION_ASSIGNMENT('A01C03','/IGNORE','$',(#703));
#292=IDENTIFICATION_ASSIGNMENT('HVM_A01C04_00','/IGNORE','$',(#112));
#294=IDENTIFICATION_ASSIGNMENT('PLATE LH','/IGNORE','$',(#112,#117));
#296=IDENTIFICATION_ASSIGNMENT('A01C04','/IGNORE','$',(#714));
#298=IDENTIFICATION_ASSIGNMENT('HVM_A01D_00','/IGNORE','$',(#113));
#300=IDENTIFICATION_ASSIGNMENT('BRACKETS - REAR AXL','/IGNORE','$',(#113));
#302=IDENTIFICATION_ASSIGNMENT('A01D','/IGNORE','$',(#725));
#304=IDENTIFICATION_ASSIGNMENT('HVM_A01D01_00','/IGNORE','$',(#114));
#306=IDENTIFICATION_ASSIGNMENT('BRACKET - REAR AXLE','/IGNORE','$',(#114,#115));
#308=IDENTIFICATION_ASSIGNMENT('12338151-8','/IGNORE','$',(#151));
#310=IDENTIFICATION_ASSIGNMENT('A01D01','/IGNORE','$',(#738));
#312=IDENTIFICATION_ASSIGNMENT('HVM_A01D02_00','/IGNORE','$',(#115));
#314=IDENTIFICATION_ASSIGNMENT('12338151-9','/IGNORE','$',(#152));
#316=IDENTIFICATION_ASSIGNMENT('BRACKET - REAR AXLE','/IGNORE','$',(#152));
#318=IDENTIFICATION_ASSIGNMENT('A01D02','/IGNORE','$',(#751));
#320=IDENTIFICATION_ASSIGNMENT('HVM_A01D03_00','/IGNORE','$',(#116));
#322=IDENTIFICATION_ASSIGNMENT('12338151-5','/IGNORE','$',(#153));
#324=IDENTIFICATION_ASSIGNMENT('A01D03','/IGNORE','$',(#762));
```

For Help, press F1

TECHNOLOGY DRIVEN. WARFIGHTER FOCUSED.



powerLOG data in Share-A-space



Share-A-space - falcon | 5.4.1 500 - Microsoft Internet Explorer

powerLOG - J

File Edit View Record Utilities Reports Help

Import Export Find New Add Update Delete Refresh Help

Address http://essev74/main/frameset/SASFrameset.aspx

Google

Raj Iyer, TARDEC

Project Role: Administrator

Effectivity: 2007-06-14 0

HMV_A_00, CHMMWVBVY

Description

Creator Craig Wyers

Created Date 2007-06-13 04:25:27

Owner AM General

Level State M

New...

Personal

Tools

Security

Workflow

Project Setup

Information

Item Structure

Presentation Options

Application Context

MaiSup[Maintenance/Support_stage]

Identifier Context

TARDEC

HMV_A_00 CHMMWVBVY

A01 | HMV_A01_00 FRAME ASSY, COMPLE

A01B | HMV_A01B_00 BRACKETS - FR

A01B01 | HMV_A01B01_00 BRAC

A01B02 | HMV_A01B02_00 BRAC

A01B03 | HMV_A01B03_00 BRAC

A01C | HMV_A01C_00 BRACKETS - FR

A01C01 | HMV_A01C01_00 BRAC

A01C02 | HMV_A01C02_00 PLATE

A01C03 | HMV_A01C03_00 BRAC

A01C04 | HMV_A01C04_00 PLATE

A01D | HMV_A01D_00 BRACKETS - RE

A01D01 | HMV_A01D01_00 BRAC

A01D02 | HMV_A01D02_00 BRAC

A01D03 | HMV_A01D03_00 PLATE

PLISN

TM

Design Change

Facility

Skill

Job

Drawing

EIAC

Indentured Item

CAGE / Ref No.

Task

PCCN / UOC

Work Area: Provisioning > Part Application (HG)

HMV

A - 00 (P)

A01 - 00 (P)

A01A01 - 00 (P)

A01B - 00 (P)

A01B01 - 00 (P)

A01B02 - 00 (P)

A01B03 - 00 (P)

A01C - 00 (P)

A01C01 - 00 (P)

A01C02 - 00 (P)

A01C03 - 00 (P)

A01C04 - 00 (P)

A01D - 00 (P)

A01D01 - 00 (P)

A01D02 - 00 (P)

A01D03 - 00 (P)

A01D04 - 00 (P)

A01E - 00 (P)

A01E01 - 00 (P)

A01E02 - 00 (P)

A01E03 - 00 (P)

A01F - 00 (P)

A01F01 - 00 (P)

A01F02 - 00 (P)

A01G - 00 (P)

A01G01 - 00 (P)

A01G02 - 00 (P)

CAGE

Reference Number

9C234

12460083-1

General

PTD

MTD/RTD/RCT

First Appearance

Misc.

Key

CAGE Code 9C234

Ref No. 12460083-1

EIAC HMV

LCN A01C01

ALC 00

LCN Type P - Physical

PLISN

Prior Item PLISN

Indenture Code

Maintenance Action Code

Max. Allowable Operating Time

Essentiality Code

Line Replaceable Unit (LRU)

SMR Code

Quantity Per Assembly (QPA)

MRR 1

MRR 2

MRR Modifier

Work Unit Code

Check out <https://www.logsa.army.mil/alc/powerLOG-J/>

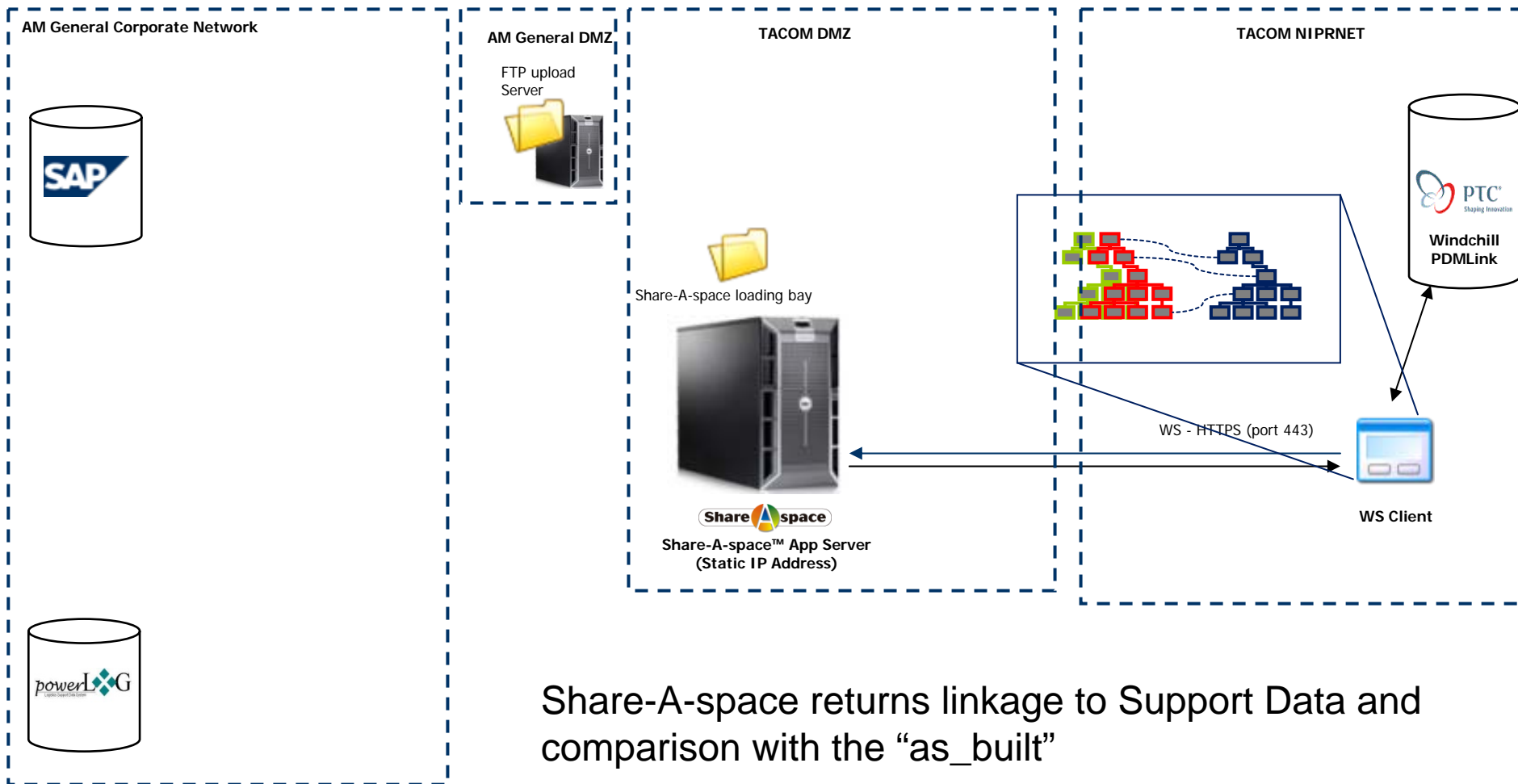
start

powerLOG - J

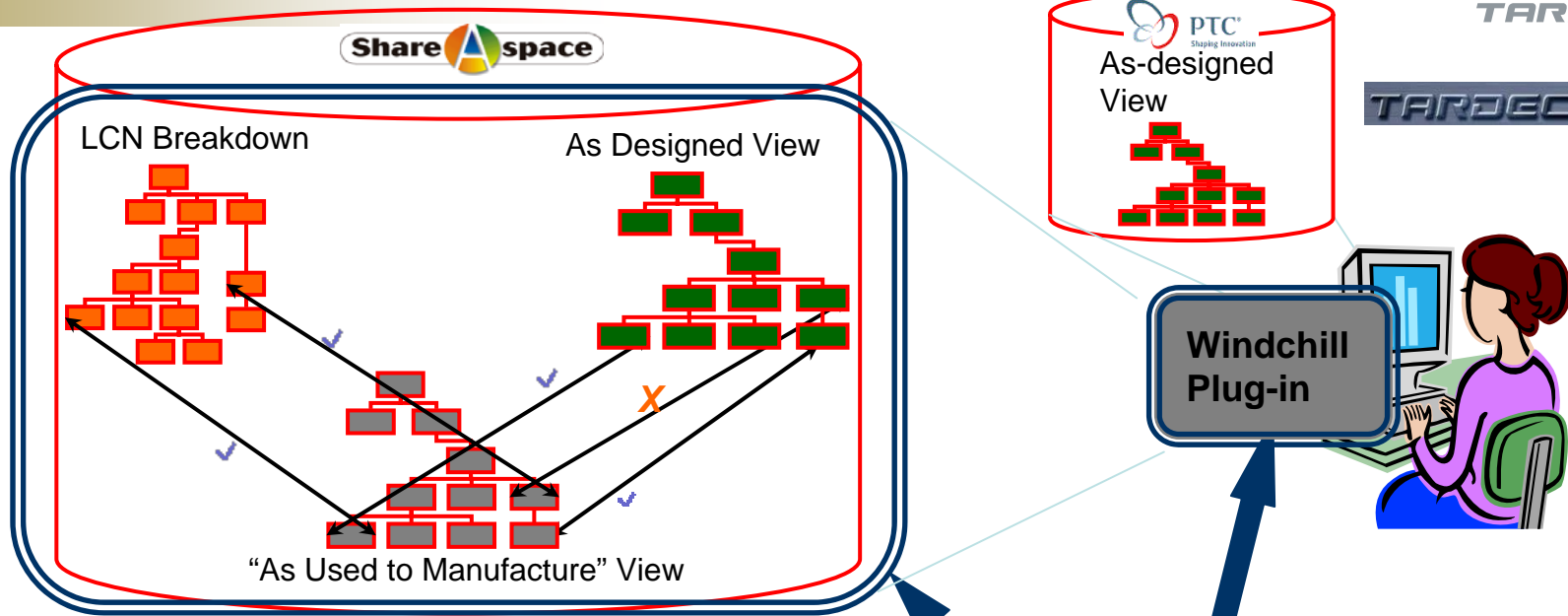
The GIMP

HMMWV Pilot – Demo Scenario

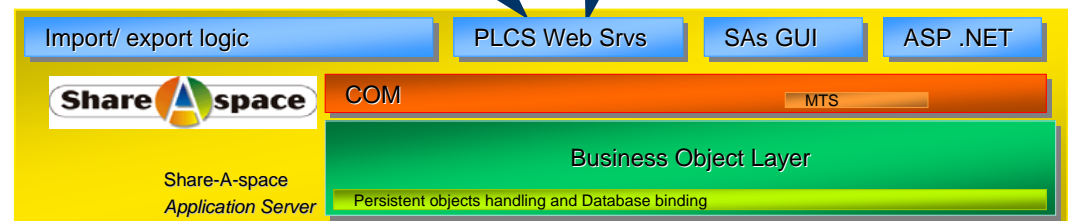
4. Consolidated Product Data Review with Windchill Plug-in



Share-A-space returns linkage to Support Data and comparison with the “as_built”



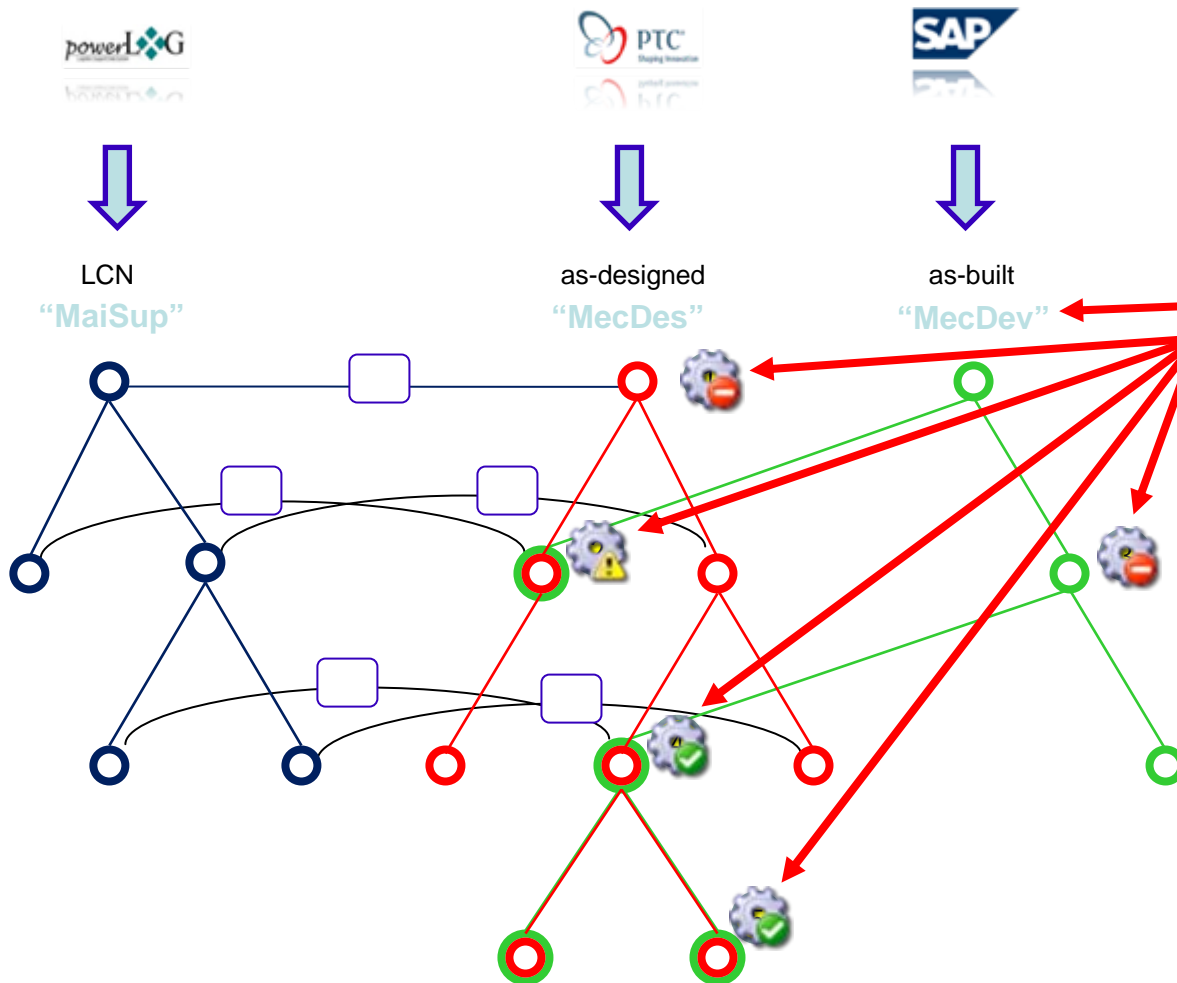
PLCS Master Data Integrator



- As-Designed data for the exhaust system comes from TARDEC's Windchill
- As-Manufactured data for the entire M1097-A2 comes from AM General's SAP system
- (Plus the LSA data from powerLog)
- Both sets of data are now available to navigate and view
 - Via the Share-A-space interface
 - Via a plug-in to Windchill
- Can now look at consistency between As-Manufactured and As-Designed structures
 - The following slide shows how differences in the structures are presented by use of icons

Data Consolidation

ACM SIGGRAPH 2004 "As-Designed Structure"



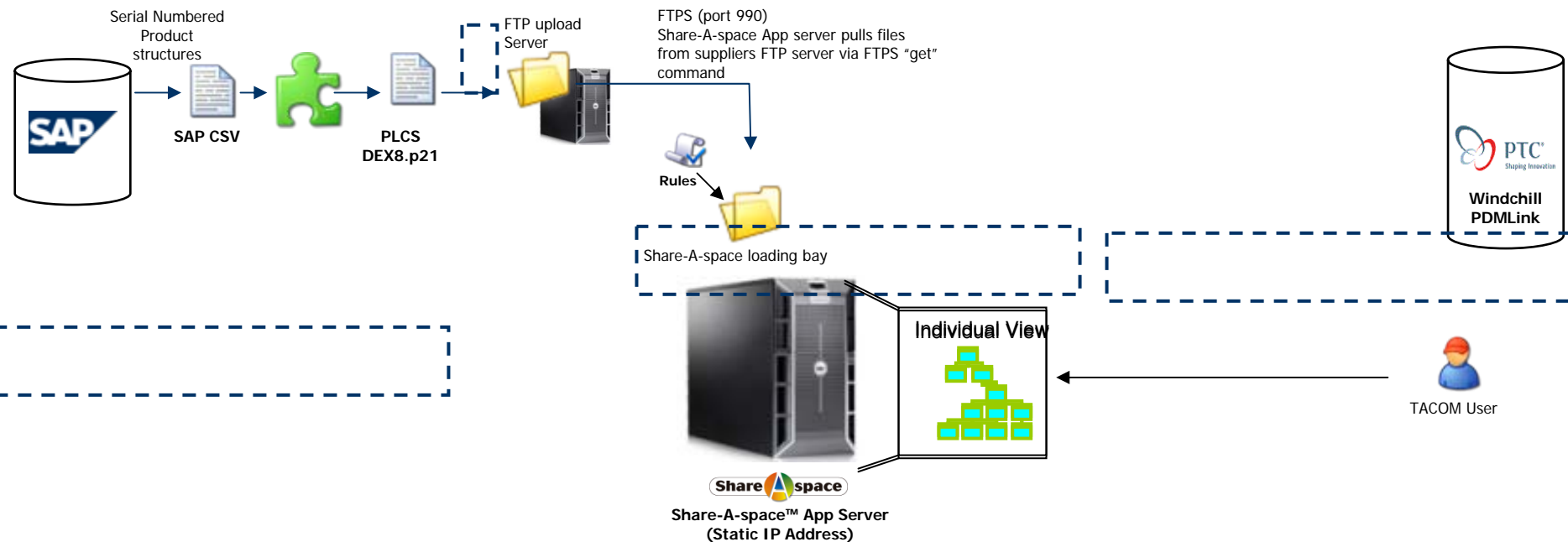
Not the Same

Applications
Different
Contexts
Children and
Each data set is
Different
given a label that
is used in the
Plug-in

HMMWV Pilot – Demo Scenario

5. Load Vehicle instance data and view in Share-A-space

- Data on serial numbered structures exported from SAP
- Mapped into PLCS
- Loaded into Share-A-space
- Four serial numbered items per vehicle
 - plus the vehicle itself



Serial Numbered data can be viewed in share space
View via Plug-in to be developed

SAP

Equipment Edit Goto Extras Structure Environment System Help

Display Equipment : SerNo.Detail

Class overview Measuring points/counters

Equipment 1000120823 Category T Military Vehicle

Description HMMWV, M1097A2

Status ECUS

Valid from 08/21/2006 Exp.date 12/31/9999

Structure Warranty Sales and Distribution Ser. data Vendor data/D...

General

Material S0016001AW

HMMWV, M1097A2

Serial number 236239

Last SerialNo 236239 History

Stock information

Stock type Plant StorageLocation Stock batch Master batch Special stock Customer Vendor Sales order WBS element Owner of stock

The serial number of a 1097A2 as held in SAP

CWEYERS sapprda1 OVR

Assignment Edit Goto Value assignment Extras Environment System Help

Display Equipment : Classification

Object

Equipment 1000120823 HMMVV, M1097A2

Class type 002 Equipment class

Assignments

Class	Description	Std...	S...	lc...	ltm
MILITARY-VEHICLE	MILITARY-VEHICLE		1	✓	10

Entry 1 / 1

Values for Class MILITARY-VEHICLE - Object 1000120823

General

Characteristic description	Value
BODY SERIAL NUMBER	00202217
Trim Feeder Line	Track 1
ENGINE SERIAL NUMB...	100HM C1116061
REPLACEMENT ENGINE	
ACCEPTANCE LOT NU...	
RETAIL DELIVERY DATE	
BUILD DATE	06/01/2006
TRANSMISSION-NUMBER	616KYPH00013711
TRANSFER-CASE NUM...	PEC12447125SBK469180
REGISTRATION NUMBER	NONE

Inconsistent

CWEYERS sapprda1 OVR

Component serial numbers for the same 1097A2 as held in SAP



SAP export – Serial numbered data as Ascii file



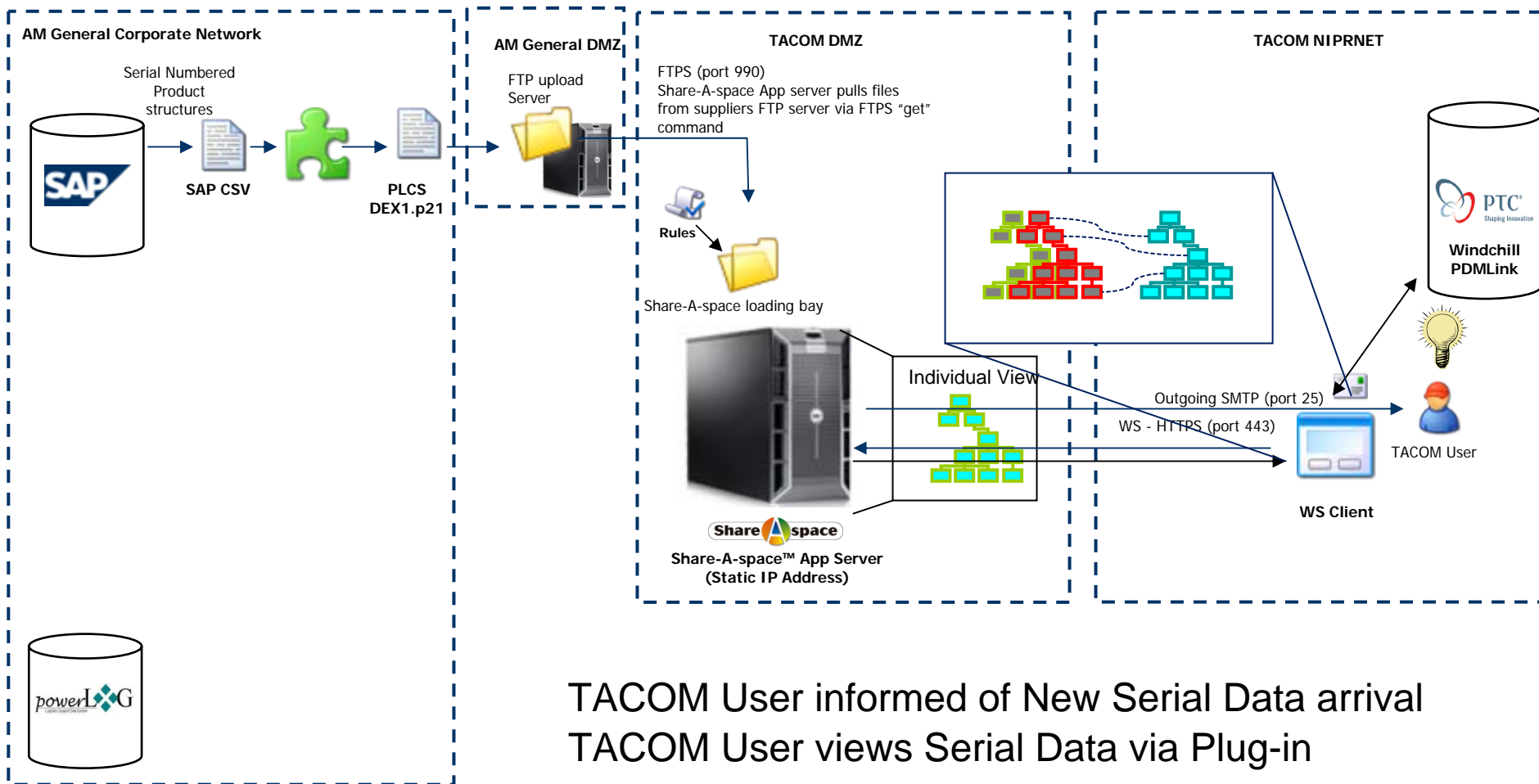
600	229934	S0016001AU	"HMMWV, M1097A2"	2-Dec-2005	8750315	R	1000113361	000000001000113361
600	229940	S0016001AU	"HMMWV, M1097A2"	2-Dec-2005	8750315	R	1000113367	000000001000113367
600	229948	S0016001AU	"HMMWV, M1097A2"	2-Dec-2005	8750315	R	1000113374	000000001000113374
600	229952	S0016001AU	"HMMWV, M1097A2"	2-Dec-2005	8750315	R	1000113378	000000001000113378
600	229958	S0016001AU	"HMMWV, M1097A2"	2-Dec-2005	8750315	R	1000113384	000000001000113384
600	229970	S0016001AR	"HMMWV, M1097A2"	3-Dec-2005	8750315	R	1000113396	000000001000113396
600	229976	S0016001AR	"HMMWV, M1097A2"	3-Dec-2005	8750315	R	1000113402	000000001000113402
600	229992	S0016001AR	"HMMWV, M1097A2"	3-Dec-2005	8750315	R	1000113417	000000001000113417
600	229996	S0016001AR	"HMMWV, M1097A2"	3-Dec-2005	8750315	R	1000113421	000000001000113421
600	230002	S0016001AR	"HMMWV, M1097A2"	3-Dec-2005	8750315	R	1000113427	000000001000113427
600	230008	S0016001AR	"HMMWV, M1097A2"	5-Dec-2005	8750315	R	1000113433	000000001000113433
600	230014	S0016001AR	"HMMWV, M1097A2"	5-Dec-2005	8750315	R	1000113439	000000001000113439
600	230022	S0016001AR	"HMMWV, M1097A2"	5-Dec-2005	8750315	R	1000113475	000000001000113475
600	230038	S0016001AR	"HMMWV, M1097A2"	5-Dec-2005	8750315	R	1000113490	000000001000113490
600	230048	S0016001AR	"HMMWV, M1097A2"	5-Dec-2005	8750315	R	1000113500	000000001000113500
600	230064	S0016001AR	"HMMWV, M1097A2"	6-Dec-2005	8750315	R	1000113515	000000001000113515
600	230592	S0016001AR	"HMMWV, M1097A2"	6-Jan-2006	8750315	R	1000114074	000000001000114074
600	230600	S0016001AR	"HMMWV, M1097A2"	6-Jan-2006	8750315	R	1000114082	000000001000114082
600	230624	S0016001AR	"HMMWV, M1097A2"	20-Dec-2005	8750315	R	1000114105	000000001000114105
600	230644	S0016001AR	"HMMWV, M1097A2"	20-Dec-2005	8750315	R	1000114124	000000001000114124
600	230652	S0016001AR	"HMMWV, M1097A2"	20-Dec-2005	8750315	R	1000114132	000000001000114132
600	230776	S0016001AS	"HMMWV, M1097A2"	23-Dec-2005	8750315	R	1000114251	000000001000114251
600	230890	S0016001AR	"HMMWV, M1097A2"	3-Jan-2006	8750315	R	1000114365	000000001000114365
600	230902	S0016001AR	"HMMWV, M1097A2"	3-Jan-2006	8750315	R	1000114376	000000001000114376
600	230908	S0016001AR	"HMMWV, M1097A2"	3-Jan-2006	8750315	R	1000114382	000000001000114382
600	230920	S0016001AR	"HMMWV, M1097A2"	4-Jan-2006	8750315	R	1000114394	000000001000114394
600	230926	S0016001AR	"HMMWV, M1097A2"	4-Jan-2006	8750315	R	1000114399	000000001000114399
600	230936	S0016001AR	"HMMWV, M1097A2"	4-Jan-2006	8750315	R	1000114409	000000001000114409
600	230944	S0016001AR	"HMMWV, M1097A2"	4-Jan-2006	8750315	R	1000114417	000000001000114417
600	230966	S0016001AR	"HMMWV, M1097A2"	4-Jan-2006	8750315	R	1000114438	000000001000114438
600	230980	S0016001AR	"HMMWV, M1097A2"	5-Jan-2006	8750315	R	1000114451	000000001000114451
600	230992	S0016001AR	"HMMWV, M1097A2"	9-Jan-2006	8750315	R	1000114463	000000001000114463
600	231008	S0016001AR	"HMMWV, M1097A2"	5-Jan-2006	8750315	R	1000114478	000000001000114478
600	231010	S0016001AR	"HMMWV, M1097A2"	5-Jan-2006	8750315	R	1000114480	000000001000114480
600	231028	S0016001AR	"HMMWV, M1097A2"	6-Jan-2006	8750315	R	1000114498	000000001000114498
600	231038	S0016001AR	"HMMWV, M1097A2"	6-Jan-2006	8750315	R	1000114507	000000001000114507
600	231044	S0016001AR	"HMMWV, M1097A2"	6-Jan-2006	8750315	R	1000114513	000000001000114513
600	231143	S0016001AR	"HMMWV, M1097A2"	10-Jan-2006	8750315	R	1000114653	000000001000114653
600	231159	S0016001AT	"HMMWV, M1097A2"	10-Jan-2006	8750315	R	1000114668	000000001000114668
600	231161	S0016001AR	"HMMWV, M1097A2"	10-Jan-2006	8750315	R	1000114670	000000001000114670
600	231183	S0016001AT	"HMMWV, M1097A2"	11-Jan-2006	8750315	R	1000114691	000000001000114691



Serial Numbered data mapped to PLCS



```
#2=PRODUCT_AS_INDIVIDUAL('/IGNORE','/IGNORE','/IGNORE');
#3=PRODUCT_AS_INDIVIDUAL('/IGNORE','/IGNORE','/IGNORE');
#4=PART('/IGNORE','/IGNORE','/IGNORE');
#5=PRODUCT_AS_INDIVIDUAL_VIEW('/IGNORE','/IGNORE','/IGNORE',#6,(),#7);
#8=PRODUCT_AS_INDIVIDUAL_VIEW('/IGNORE','/IGNORE','/IGNORE',#6,(),#9);
#10=EXTERNAL_CLASS('/IGNORE','Serial_identification_code','/IGNORE',#11);
#12=EXTERNAL_CLASS('/IGNORE','Organization_identification_code','/IGNORE',#11);
#14=EXTERNAL_CLASS('/IGNORE','Version_identification_code','/IGNORE',#11);
#15=EXTERNAL_CLASS('/IGNORE','In-Service','/IGNORE',#11);
#16=EXTERNAL_CLASS('/IGNORE','Maintenance','/IGNORE',#11);
#17=EXTERNAL_CLASS('/IGNORE','Part_identification_code','/IGNORE',#11);
#18=EXTERNAL_CLASS('/IGNORE','Development_stage','/IGNORE',#11);
#19=EXTERNAL_CLASS('/IGNORE','Mechanical_design','/IGNORE',#11);
#20=EXTERNAL_CLASS('/IGNORE','Name','/IGNORE',#11);
#21=EXTERNAL_CLASS('/IGNORE','Start_Date','/IGNORE',#11);
#11=EXTERNAL_CLASS_LIBRARY('urn:plcs:rdl:std','/IGNORE');
#36=CLASSIFICATION_ASSIGNMENT(#10, (#23), '/IGNORE');
#37=CLASSIFICATION_ASSIGNMENT(#12, (#38), '/IGNORE');
#53=CLASSIFICATION_ASSIGNMENT(#21, (#54), '/IGNORE');
#55=CLASSIFICATION_ASSIGNMENT(#10, (#33), '/IGNORE');
#56=CLASSIFICATION_ASSIGNMENT(#13, (#32), '/IGNORE');
#57=CLASSIFICATION_ASSIGNMENT(#20, (#35), '/IGNORE');
#58=CLASSIFICATION_ASSIGNMENT(#13, (#34), '/IGNORE');
#59=CLASSIFICATION_ASSIGNMENT(#21, (#60), '/IGNORE');
#7=PRODUCT_AS_REALIZED('/IGNORE','/IGNORE',#2);
#9=PRODUCT_AS_REALIZED('/IGNORE','/IGNORE',#3);
#61=PART_VERSION('/IGNORE','/IGNORE',#4);
#6=VIEW_DEFINITION_CONTEXT('/IGNORE','/IGNORE','/IGNORE');
#49=VIEW_DEFINITION_CONTEXT('/IGNORE','/IGNORE','/IGNORE');
#62=PRODUCT_CATEGORY('/IGNORE','part','/IGNORE');
#63=PART_VIEW_DEFINITION('/IGNORE','/IGNORE','/IGNORE',#49,(),#61);
#64=PRODUCT_DESIGN_VERSION_TO_INDIVIDUAL(#61,#7);
#65=PRODUCT_DESIGN_VERSION_TO_INDIVIDUAL(#61,#9);
#66=PRODUCT_DESIGN_TO_INDIVIDUAL(#4,#2);
#67=PRODUCT_DESIGN_TO_INDIVIDUAL(#4,#3);
#54=DATE_OR_DATE_TIME_ASSIGNMENT(#68,'/IGNORE',(#7));
#60=DATE_OR_DATE_TIME_ASSIGNMENT(#69,'/IGNORE',(#9));
#68=CALENDAR_DATE(2005,12,2);
#69=CALENDAR_DATE(2005,12,3);
#23=IDENTIFICATION_ASSIGNMENT('229934','/IGNORE','$',(#2));
#38=IDENTIFICATION_ASSIGNMENT('9C234','/IGNORE','/IGNORE',(#1));
#25=IDENTIFICATION_ASSIGNMENT(' ','/IGNORE','$',(#7,#9));
#27=IDENTIFICATION_ASSIGNMENT('8750315','/IGNORE','$',(#4));
#29=IDENTIFICATION_ASSIGNMENT('R','/IGNORE','$',(#61));
#31=IDENTIFICATION_ASSIGNMENT('S0016001AU','/IGNORE','$',(#2));
```



TACOM User informed of New Serial Data arrival
TACOM User views Serial Data via Plug-in

- The architecture proposed for FALCON has been successfully demonstrated with AM General
 - The PLCS standard and Share-A-space technology provide a “master data integrator” function
 - TARDEC and AM General continue to use existing systems
- Through FALCON, TARDEC can have access to a richer data set from OEMs
 - As-used-to-manufacture data and LSAR data available at TARDEC as well as approved design
 - Access to the data can be made available through TARDEC’s existing tool (Windchill)
- FALCON enables a route for improved data synchronization between AM General and TARDEC
 - Automated processes can be established
 - Manual intervention in the exchange of data can be eliminated
 - Out of Sync data can be identified

- FALCON delivers improved Data Quality
 - Inconsistencies identified between As-released and As-used-to-manufacture
 - Version differences
 - Part numbering and naming differences
 - Different names between LSAR and As-released for same part
- FALCON enables use of simple add-on services via web-services
 - Bill-of-Material comparator (part of the Plug-in)
- FALCON offers the possibility of a through life approach
 - Individual (serialized) data from SAP now available to TARDEC
 - Starting point for tracking configuration of individual vehicles
 - Individual and support data in line with PLCS

- FALCON's use of PLCS as the mediation format and Share-A-space as a host technology provide:
 - Reconciliation of product data cross-application
 - Configuration control of lifecycle views
 - Transparent interoperability services
 - Independence between OEM and Army IT systems
 - Platform for additional application capability
 - Absence of data lock-in
- FALCON approach applicable to other vehicle programs
 - Demonstration achieved using open approaches without company specific developments